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BARN PLANS

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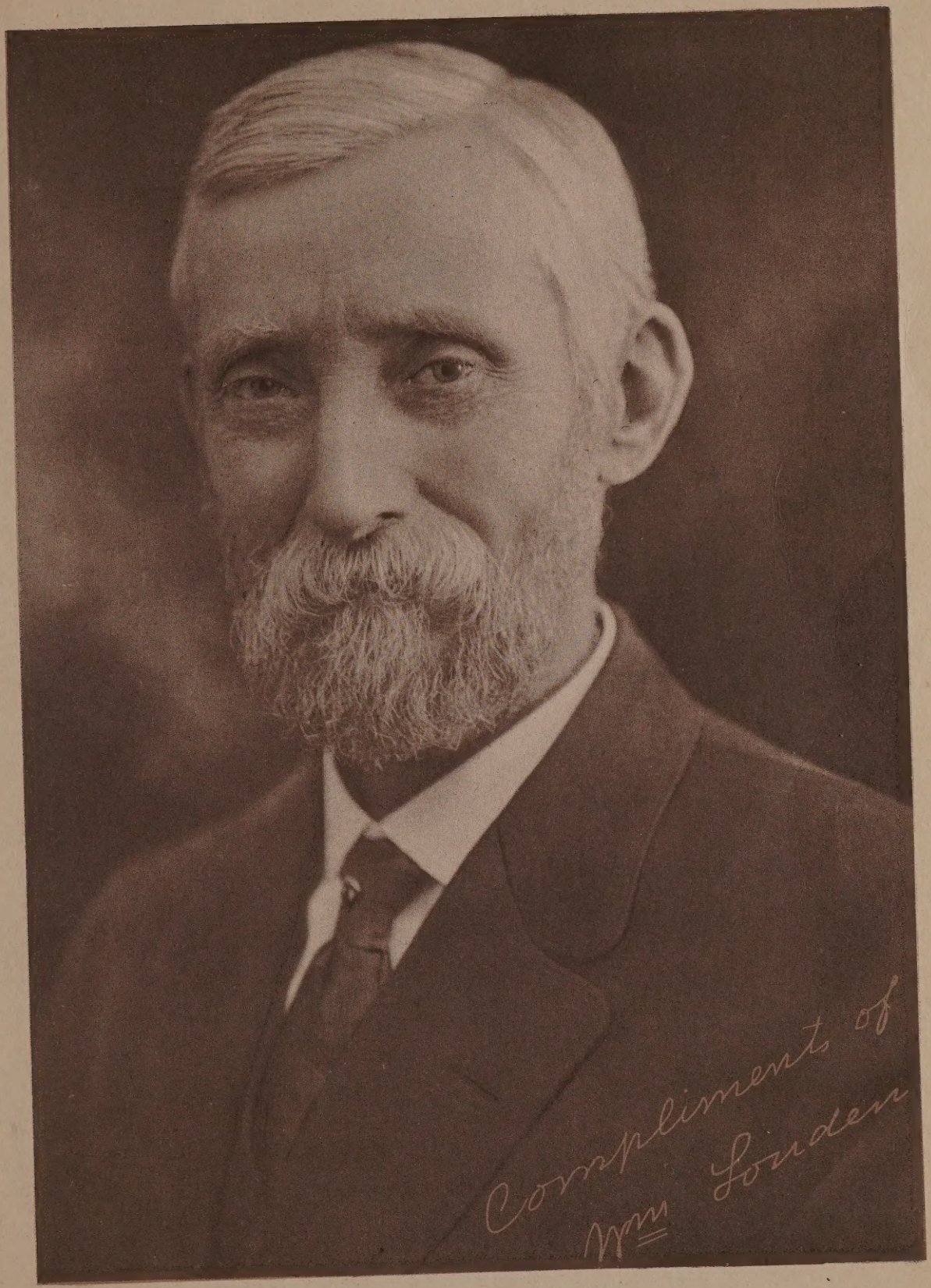
Compliments of
Wm Louden

E.E. Lehmann's Barn, Lake Villa, Ill.
Louden Planned and Equipped

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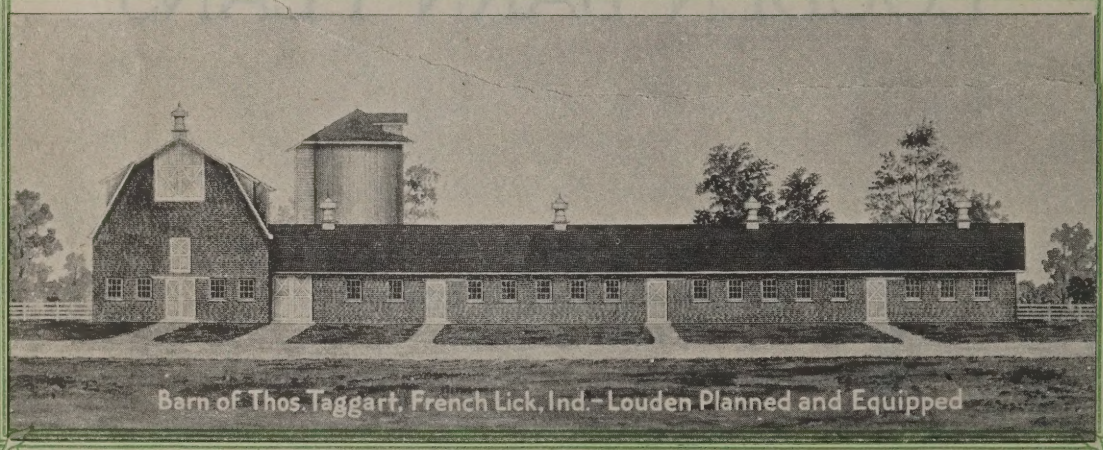
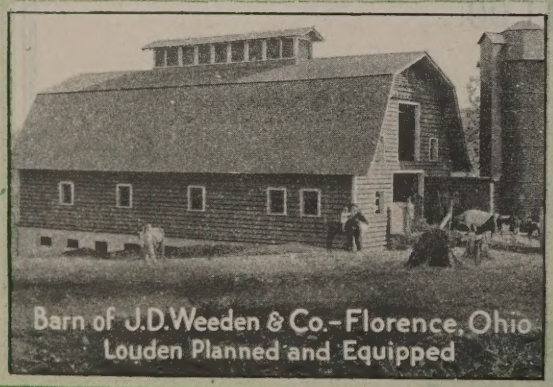
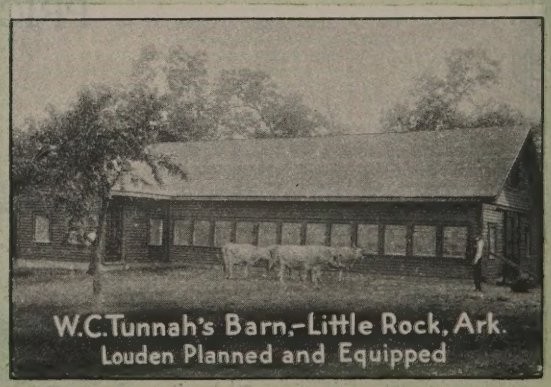
E.E. Lehmann's Barn,-Lake Villa, Ill.
Louden Planned and Equipped



Barn of Thos. Taggart, French Lick, Ind.-Louden Planned and Equipped



Barn of J.D. Weeden & Co.-Florence, Ohio
Louden Planned and Equipped



W.C. Tunnah's Barn,-Little Rock, Ark.
Louden Planned and Equipped

FOREWORD

This book is published with the view of aiding the farmer and dairyman in building his barns so they will properly and economically answer the purpose for which they are intended.

Our Architectural Department was established for the purpose of assisting our customers in not only planning barns that will meet all their requirements in the most economical construction, but also to assist them in solving all other problems that come up, such as proper lighting, heating, ventilating, drainage, disposal of manure, and other sanitary and hygienic problems, as well as proper protection against weather exposure and fire risk.

The department is conducted by men of wide experience who are competent to handle all kinds of farm building construction, and they will combine utility and sanitation together with economy and strength. Our landscape architect can so arrange the farm buildings of any large estate that they will harmonize with their surroundings, and be in harmony with one another. Your farm buildings can display individuality and good architectural design, and at the same time be practical, modern and convenient, separately and collectively.

All the plans shown in this book are our own original designs, produced by our Architectural Department. Some of them have been copied from our illustrations and published in other books and periodicals. A complete index will be found on page 112.

These plans represent the practical results from ideas mostly originated by farmers and dairymen, but are worked out in detail by our expert dairy architects to meet the climatic conditions and other requirements of individual cases.

Let Us Help You Plan Your Barn

Whenever you build a barn or any other kind of building, you build for a definite purpose; this definite purpose should be kept in mind from the start to the finish. Whether it be for properly housing and caring for live stock, for the storage of feed and farm implements, for preparing products for market, or for a combination of some of these, no matter what the purpose may be, it should be built with the correct amount of floor space for each purpose, the total of which will determine the size of the building.

This rule seems very simple, but sometimes becomes very complicated when the question of economical construction is taken into consideration. For example, a barn 40 feet square would have a floor area of 1,600 square feet, and may be of the correct size and meet all the requirements for which it is intended. At the same time it may be found after careful calculation that a building 32x50 feet, which has the same floor area, will also meet the same requirements, and may cost less on account of not requiring so heavy construction for a 32-foot span as would be necessary for a 40-foot span. This is where the practical builder and trained architect, who is thoroughly versed in the requirements of modern farm buildings, can be of great service to the farmer and dairyman.

Write Us About Your Building Problems

Through the large number of inquiries received and designs worked out, this department becomes an exchange of ideas about farm buildings. New ideas about construction and arrangement are received every day, and new plans developed to suit individual needs.

Modern Barn Requirements

Each barn should be an individual study, and its construction, size and arrangement should represent the results of a systematic analysis of the kind of barn needed. It should be of such a size as will comfortably and economically hold the live stock, feed, bedding, and all articles that it is to contain. The construction should be so that it will resist the weather and be permanent. It should be as fire-resisting as the financial investment will admit. It should be free of all unnecessary posts and other structural members that would interfere with the convenient and economical handling of materials, stock, products and by-products.

Make The Cows Comfortable

Cow comfort receives much attention, because practical tests have demonstrated that an improvement giving comfort and making the cows contented is a good investment. Too much thought and study can not be given to the construction, arrangement and equipment of the barn for the comfort and profit of the herd.

Good Ideas From Practical Men

These plans are not submitted to the reader as designs that will be just what he ought to have to obtain the best possible returns from his farm, but they will meet most of the general requirements for various capacities, uses and climates. They are selected from among the last 2,000 plans drawn by our architects.

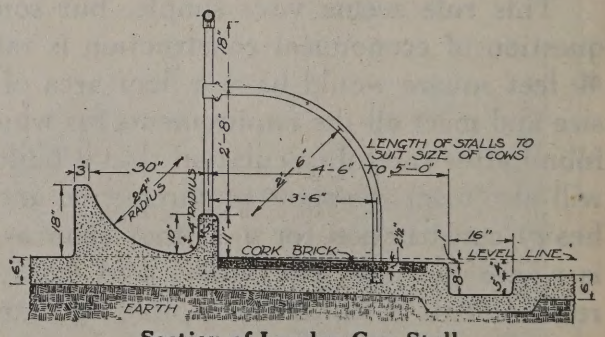
Construction

We will not attempt to go into detail and give the methods of construction best for certain purposes, as this would require more pages than this entire book contains, but we desire to call attention to some facts that may be of general interest.

Concrete and metal are now used where materials are subject to decay from moisture and from weather conditions.

Hollow tile are becoming very popular for walls, because they resist fire and insulate against heat and cold.

Lumber is used for those parts least affected by accumulation of moisture, as it costs less and will serve the purpose.

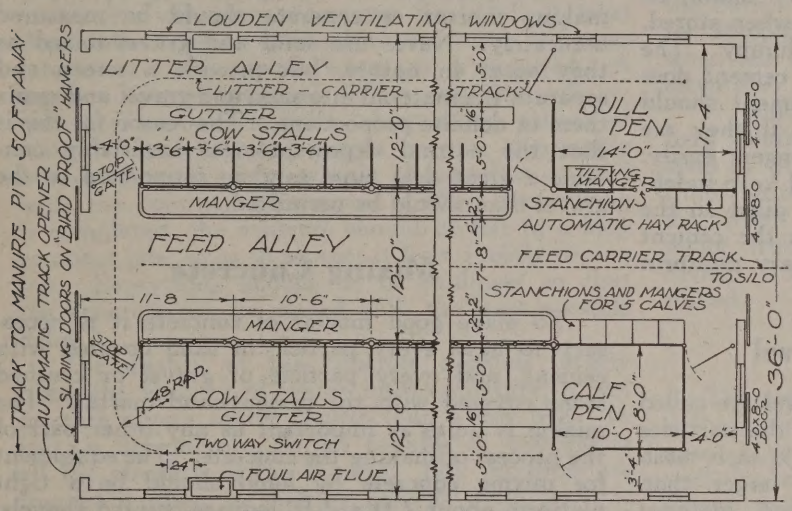


Section of Louden Cow Stall

Sheet metal, such as corrugated galvanized iron, is much used where light construction and fire resistance from the exterior are desired, and for light roof construction for hay sheds, shelter sheds, implement sheds, etc.

Use Plenty of Windows

Sunshine is the world's best and cheapest disinfectant, and therefore the more windows you place in the walls of the dairy barn the better. It is impossible to get too much light in a barn for any kind of live stock. Some argue that it is hard to keep out flies if the barn is not dark. Put shades on the windows to pull down when the stock is let out, keep the barn clean, and locate the manure pit 100 feet from the barn, and the flies will not bother you. In extremely cold climates it is well to use double glazed sash, or put on extra storm sash in winter.



Typical Plan of Dairy Barn

The windows should be so constructed that when open the draft will not blow directly on the cows or permit rain, sleet or snow to blow in.

Save Labor

Farmers realize the value of labor-saving devices because of the shortage of help.

Locate the silo where it will be convenient for feeding as well as filling. Locate the feed bins where they can be reached with the least number of steps, and locate the manure pit where you will not have to push the load up hill, if it can be avoided. Properly handle feed and manure by using improved methods and labor-saving appliances, and you will greatly increase the earning capacity of your dairy.

The barn must be convenient for your help, as well as comfortable for your cows. It should be sanitary, and so equipped that no labor is lost in cleaning or feeding. It might be built according to one or a dozen plans, and fitted with this or that ventilating system, but the principles of each are the same and should combine convenience and comfort with sanitation, strength and durability.

Write us for any information you need that is not covered in this book. Any ideas that we have gained through our **50** years of barn specializing experience are yours.

Our Agricultural-Architecture department offers the opportunity for expert and impartial advice and assistance on all important farm and farm building operations.

We can furnish a man of acknowledged ability to visit you and consult with you upon any subject relating to the betterment of the farm, whether your desire is to increase the efficiency of an old farm and its buildings, or to establish a newly acquired estate upon a modern basis.

The choice of a property is often difficult for the inexperienced. An expert opinion on the worth and adaptability of land is a part of our service. The fees for this special service are very reasonable.

AGRICULTURAL-ARCHITECTURE DEPARTMENT,
LOUDEN MACHINERY COMPANY.

GENERAL INSTRUCTIONS FOR BARN CONSTRUCTION

— Concrete —

Materials

Concrete is ordinarily composed of cement, sand, gravel or crushed stone and water. The selection of these materials is largely dependent on local conditions, and while no unalterable rule can be laid down in regard to it, certain general conditions may serve as a guide to the inexperienced.

Cement

Portland cement of the best quality should be used. It must be carefully protected when stored. If the cement gets damp it becomes lumpy. The presence of a few lumps in a sack of cement does not spoil the whole sack, but the cement should be screened and the lumps rejected, if they are too hard to crumble between the fingers easily. If the cement is properly stored it will keep indefinitely, but the sacks should never be piled on the ground nor on a damp floor. Unless the cement can be piled on a dry floor a temporary platform should be provided.

Sand, Stone and Gravel

The sand and broken stone or gravel are called the "aggregate." Generally speaking the particles which pass through a sieve having a ¼-inch mesh are considered "sand" while those larger than ¼-inch are called "gravel." A fine material from crushed stone and known as "stone screenings" is sometimes used as a substitute for sand. Theoretically such a material is good, but, as usually obtained, the screenings contain an excessive amount of stone dust which makes the material unsuitable for concrete unless the dust and very fine particles are screened out. Sand and gravel are probably the most popular materials because they are frequently found in nature in a condition practically ready for use and may be secured at little cost.

The sand should be clean. An idea of its cleanliness may be obtained by shaking some of it with water in a glass jar, and if there is a decided muddiness it is evident that the sand is too dirty to use in its original condition. The sand can be cleaned by stirring it in a tank with two or three changes of water, or by spreading it in a thin layer and washing it with a hose. Preference should be given to sand containing a mixture of coarse and fine grains. Extremely fine sand does not make a strong mortar. If it is the only sand at hand, get a coarse material and mix with it.

Either **crushed stone or clean gravel** is suitable for the coarse material. It is chiefly a question of which can be obtained at the least cost. Good concrete cannot be made with flat stones, especially if they are soft and shaly. Neither are long, splintery stones suitable. Stone which disintegrates upon exposure to the weather, or that which has a chalky surface, will not make strong and satisfactory cement.

Proportions

The quantities of all the materials used in making mortar or concrete should be measured accurately. Never use sand and gravel mixed as they occur in nature, but provide a screen and separate the material into sand and gravel and remix them in definite proportions. The reason for this is that the natural deposit almost invariably contains a great deal more sand in proportion to the gravel than should be permitted.

Mixing Concrete

To make good mortar of concrete it is necessary to have every particle of sand covered with cement, and every particle of gravel or crushed stone covered with the cement-sand mortar. The mixing is quite as important as any other part of the process of making the concrete. The equipment for mixing concrete by hand should be a tight platform about 7 ft.x12 ft., square-pointed shovels, a mortar hoe, steel-body wheelbarrow, sand screen, mortar box, water barrels, buckets, and a measuring box holding four cubic feet.

A well-made mixing platform should be a part of the regular equipment of a farm, and it will be cheaper to build a good one at the outset than to waste time and money in constructing and using temporary ones. Such a platform can be built as follows: using 2-inch lumber, nailed upon three 4x4-inch stringers rounded at the ends. The outside stringers project a little at both ends of the platform and are bored for clevis irons, so that the platform may be readily dragged about the farm. To make this platform requires the following:

Bill of Lumber

12 pieces 2 in. x 12 in. x 7 ft. dressed on one side and two edges.

2 pieces 2 in. x 2 in. x 12 ft. dressed on one side and two edges.

2 pieces 4 in. x 4 in. x 13 ft. rough.

1 piece 4 in. x 4 in. x 12 ft. rough.

The reason for specifying dressed lumber is to

provide a smooth and tight platform which will reduce the work of shoveling.

Workmanship and Quality

In preparing to mix a batch of concrete, the materials should be carefully measured and not guessed at. First spread the sand in a thin layer over a portion of the platform. Then empty the cement on top of the sand and mix both together dry, continuing the turning until the color is uniform and without streaks of sand or cement. After the cement-sand mixture has thus been turned at least twice, spread it into a thin layer and dump upon it the gravel which has been previously measured. The mixing is then repeated until the gravel is thoroughly distributed throughout the mass; this will require turning the batch at least three times. Make a trough in the center and pour into it nearly as much water as is required. A medium wet mixture of 1:2½:5 concrete will require for a one-sack batch about seven gallons of water. The whole mass must now be thoroughly mixed, or until every particle of gravel is covered with the cement-sand mortar. When the mixing is completed, the concrete should be left in a long compact pile, so as to protect it from rapidly drying out. Everything should be in readiness so that the concrete can be placed with the least possible delay.

The quality of the concrete depends largely upon the amount of water in the mixture, a wet mixture giving better results than a dry one. In fact, a dry mixture is not capable of developing all the strength of the cement. Dry mixtures are frequently used in making cement products, but the practice is a bad one and should be avoided whenever possible.

Write for circular of our Champion mixer.

Foundation Walls

The foundation walls below the ground, the lower story walls from the ground up to the window-sills, and the ground floor, should be built of concrete.

It would be well to build the entire outside walls of the first story out of concrete, hollow tile or brick, but if this is found to be too expensive the concrete should be run at least 12 inches above the lower floor and 18 inches above the ground, so that all danger from moisture rotting the bottom of the wood construction will be avoided.

A concrete foundation should extend down deep enough to avoid all danger of frost, and down to permanent moisture of the ground in climates where alternate wet and dry seasons occur.

The base or footing should be not less than 2 feet thick, and the wall may taper to a thickness of 1 foot at the surface of the ground.

For frame barns built on level ground the concrete foundation above ground should be 18 inches high, and at least 8 inches thick. If the concrete floor is laid on top of the ground (after sod and loose dirt are removed) its surface should extend about 6 inches above the exterior grade to prevent storm water from running into the barn, and the concrete wall should extend 12 inches above the floor, which will make it about 18 inches above the outside ground surface.

Concrete Floors

The concrete floor in a room which is to contain live stock should never be lower than the ground level at the door where they enter the room, so that it be necessary for the stock to step **down** to the floor in place of **up** to the floor level in entering the barn. Many a good animal has been crippled by stepping down over a door-sill and slipping when her feet struck the smooth floor at a lower elevation.

A concrete approach on the outside of the barn leading from the ground level up to the floor level at each doorway will not only prevent stock from stumbling, but will prevent considerable dirt from being tracked into the barn, and will make trucking or driving into the barn much easier. The surface of approaches should be ribbed.

Cost

The cost of concrete construction in most cases will run from 20 to 30 cents per cubic foot. To give an example of cost of a concrete foundation wall for a frame barn, the foundation wall as shown in the sectional view on page 12 requires a little less than 4 cubic feet of concrete for every foot of its length, and is estimated to cost $1.00 per running foot. If a mixture that is composed of one part cement, two parts sand and four parts gravel (by volume) is used, it would require ⅕ barrel of cement, $\frac{1}{11}$ cubic yard of sand, and ⅛ cubic yard of gravel per running foot.

This estimated price covers the cost of forms and all false work that is required for its installation, and makes the most economical foundation that can be installed.

LOUDEN MACHINERY CO.,

Gentlemen:

I think your equipment throughout is the best I have ever seen. I do a great deal of traveling about and have examined a great many different stables, but have never seen one I like as well as my own. I am so well pleased with it that I am going to get equipment for another stable this fall. I also think your firm is as good as any I have ever dealt with in any line.

Yours truly,

(Signed) J. M. MOUNT,
DAMASCUS, MD.

Locating the Floor Levels

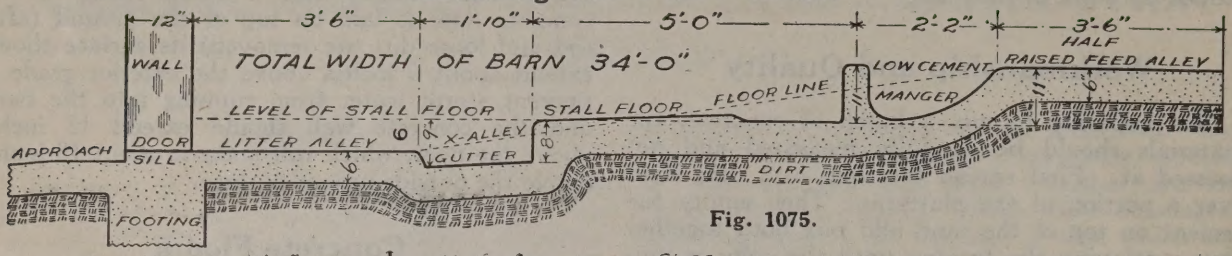


Fig. 1075.

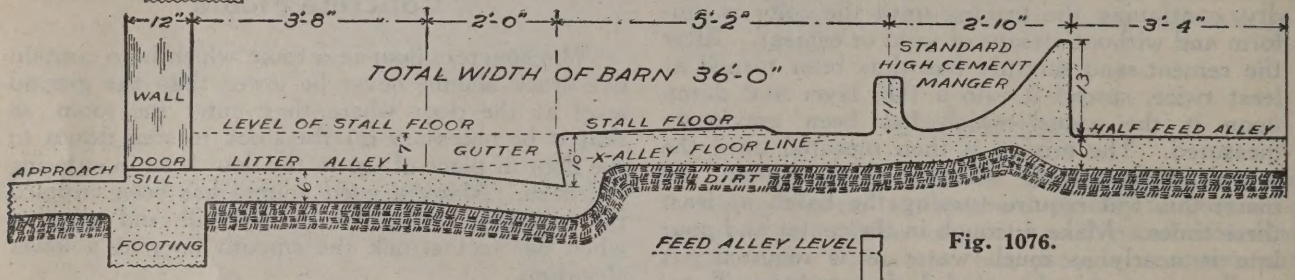


Fig. 1076.

Fig. 1079.

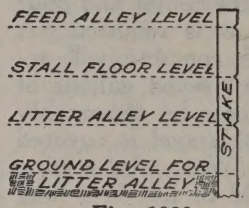


Fig. 1080.

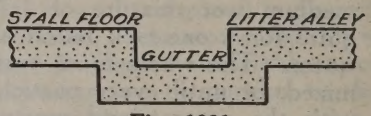


Fig. 1081.

Locating the floor levels is one of the most important things in the equipment of a Dairy Barn. It is important not only in getting the proper drainage of the mangers and gutters, but also in getting the proper grades of the floors to make them correspond with the outside approaches. The diagrams, Figs. 1075 and 1076, are sections of half a stable floor with the cows "headed in," and Figs. 1077 and 1078 are the same with the cows "headed out." They represent four different kinds of mangers and four different kinds of gutters, but there is **one point** in which they are **all alike.** All the **litter alley** floors on which the cows must travel to and from the stalls are practically **on a level with the door sills** over which the cows must pass. They should have a little slope toward the gutter so that water will drain into it but otherwise should be level. This is the key in getting the floor levels. As will be seen by the diagrams, the stall floors vary from 5 to 8 inches in height **above** the litter alley floors, according to the style of gutter used, but the litter alley floors are always to be practically on a **level** with the stable door sill. It is all right to have a short drop on the **outside** of the sill, as shown by Figs. 1075 and 1076, to keep the rain from beating in, (one or two inches of a drop will be sufficient), with a short, level outside, (a foot wide), to prevent slipping, but there should never be a raised sill with slanting floors, like that shown by Fig. 1079, for the cows to stumble over and to cause them to slip and fall when the floors are wet.

GETTING THE GRADES—To prepare for setting up the stalls and putting in the cement, level off the dirt where it is too high and fill in where it is too low, being sure to thoroughly wet down and tamp all filled dirt so it will be **completely settled and solid** before proceeding further. Probably the best way to get the ground levels is to make a lot of stakes, like that shown in Fig. 1080, with notches on one edge to correspond with the different levels, and set them in rows some twenty feet apart across the stable floor, three or four stakes in a row, equal distances apart; and drive them in until the different notches are the proper levels. Lines being stretched on these stakes to get the different levels will be held securely in place by the notches and will not be liable to slip out of position. If preferred, the notches can be sawed in the stakes after they are driven, care being taken to mark and saw the notches the right distances apart. Marks may also be made on the walls to assist in getting the levels.

The ground levels will be **six inches below the finished floor levels** unless more than six inches of cement is required, or when an extra heavy foundation is wanted for a floor of Cork-Brick or Creosoted Pine Blocks. When the cement is to be six inches thick, **the average ground levels for the Litter Alleys will be six inches below the stable door sills,** and taking this as a basis, all the other levels can be easily determined for any kind of installation by referring to the height measurements given in Figs. 1075, 1076, 1077 and 1078. In Fig. 1075 the stall floor level is 6 inches above the litter alley level. In Fig. 1076 it is 7 inches above; Fig. 1077, 8 inches above, and in Fig. 1078, 5 inches above. In Fig. 1075, the feed alley level is 11 inches above the stall floor level and in Fig. 1078 it is 7 inches above. In Figs. 1076 and 1077 the stall floor levels and the feed alley levels are the same, and they may be made the same in the others if preferred. The feed alley floors may also be made as low as the litter alley floor if desired, in which case the cross alley floors will be level.

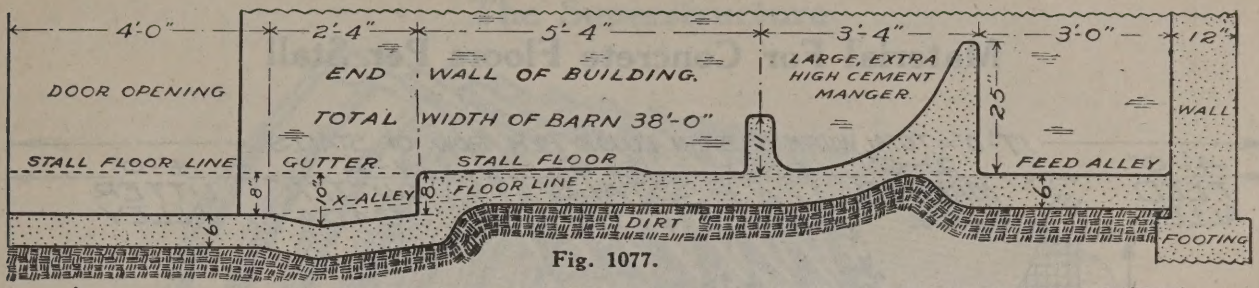


Fig. 1077.

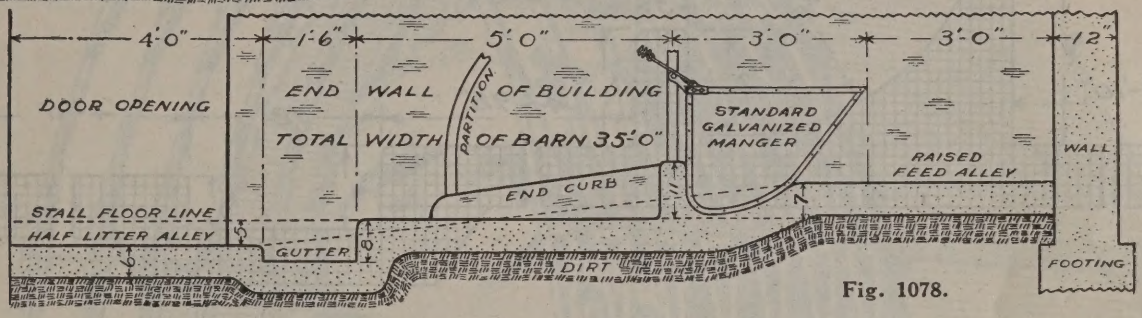


Fig. 1078.

The cross alley grades from the litter alleys to the feed alleys are shown in the diagrams by dotted lines, marked "X Alley Floor Line" in Figs. 1075, 1076 and 1077. They should be given due consideration before determining the kind of installation to select and the ground levels brought to grade. The doors in the feed alleys may be made to correspond with the floors either by raising the door sills and the approaches thereto, or by making the approaches on the inside from the door sills up to the feed alley floor levels, like the cross alley grades. When pens for calves, cows or bulls are to occupy a part of the floor the grades will have to be arranged to accommodate them, or the pens located to correspond with the grades. Generally the litter alley grades or something a little higher will be suitable for the pens. Avoid steep inclines in the floors as much as possible.

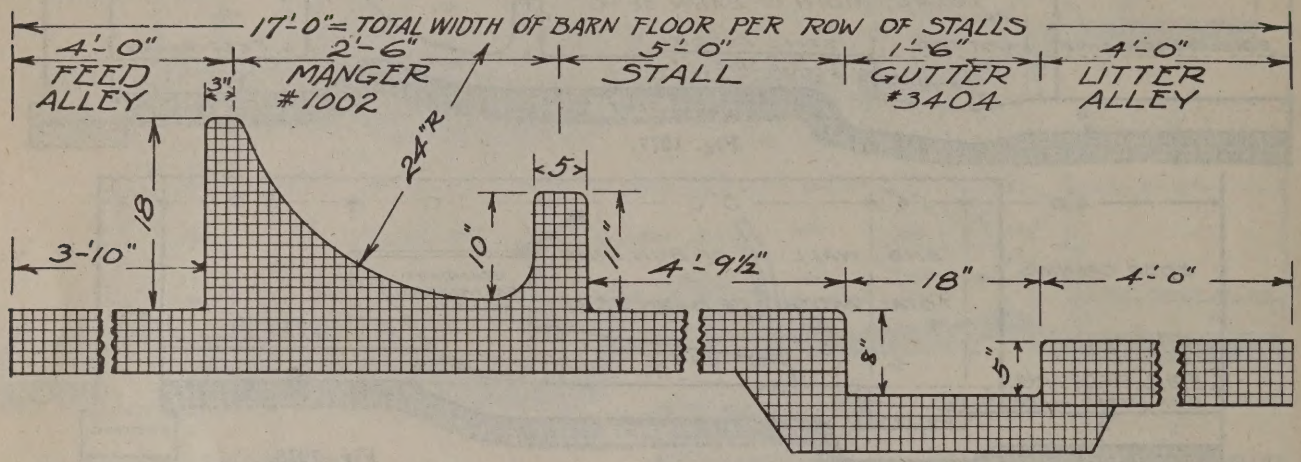
DRAINAGE GRADES—There should be a certain amount of slope lengthwise in both manger and gutter. This is especially desirable in flushing out the manger and where the liquid manure is drained into a cistern through a sewer. Different authorities specify different pitches for the drain. The drop ranges from one to two inches in fifty feet for the mangers. Where the manger is used for watering the stock the incline must not be great enough to make the water run too much to one end. The gutter requires more fall than the manger. Where the row of stalls is 100 feet or more, it is best to have two or more points of drainage, a 50-foot stretch being about all that should be carried into one drain.

The slope may be from the center to the ends, or from the ends to a single drain in the center. This will be sufficient to properly wash out the mangers and flush the gutters and keep the stable in a good, sanitary condition. The less the incline, consistent with good drainage, the better, because it makes the equipment look better and will be better. The truer the cement work, the less the incline required. Sometimes it is best to slope the entire barn floor lengthwise toward the drain.

The drainage grades which run lengthwise of the barn being slight, the dirt grades lengthwise may be made nearly level throughout in which case the cement will be a little thicker at some places than at others, varying probably from 6 to 7 inches or from 5½ to 6½ inches. It will pay well, however, to get the dirt grades to conform as nearly as possible to the finished floor grades and in no case should the variation in the dirt grades be so much that the cement will have to be 8 or 9 inches thick in some places and only 3 or 4 inches in other places.

VARIATIONS IN MEASUREMENTS—Figs. 1075, 1076, 1077 and 1078 show different widths of mangers, stall floors, feed and litter alleys, and gutters which may be necessary to suit different sizes of cows, different widths of barns and other contingencies. Any of these measures except the mangers, which are **standardized,** may be further varied to suit requirements, and any of the different styles of gutters may be used with any of the different mangers and vice versa. Also, other styles of gutters may be used but a gutter like Fig. 1081, with the litter alley floor level with the stall floor, making a deep ditch over which the cows will generally jump in entering the stall and against the rear side of which the cows' feet are liable to catch in leaving the stall, should not be used. A cow giving milk should **never be compelled to step across a ditch or over a raised door sill.** There is nothing in the claim that the high rear edge of the gutter is necessary to prevent "spattering the wall." To make it effective in preventing "spattering," it would have to be made much higher than it is possible to have it. Write for directions for erecting Louden Sanitary Cow Stalls and constructing Louden Standardized Mangers.

Material For Concrete Floors Per Stall



Amounts of Cement, Sand and Gravel Required for Floor Construction

The concrete mangers and gutters form part of the concrete floor work of a dairy barn and are always estimated and installed together with the regular flat slab floors. The irregular outline of the mangers and gutters makes it very hard for the inexperienced to calculate just how much cement, sand and stone is required for the construction, and we have therefore prepared the above cross section.

This section represents a floor 17 feet wide for one row of cow stalls with feed and litter alleys, or just one half of the width of a floor for a barn 36 feet wide, which is the average width of a dairy barn for two rows of cows.

Each of the little squares of this cross section represents a square inch of concrete, and by the table below the floor has been divided into five parts, and the cubical yard contents of each part calculated separately for a panel of floor work 3 feet 6 inches in length, which is the average length required per stall width.

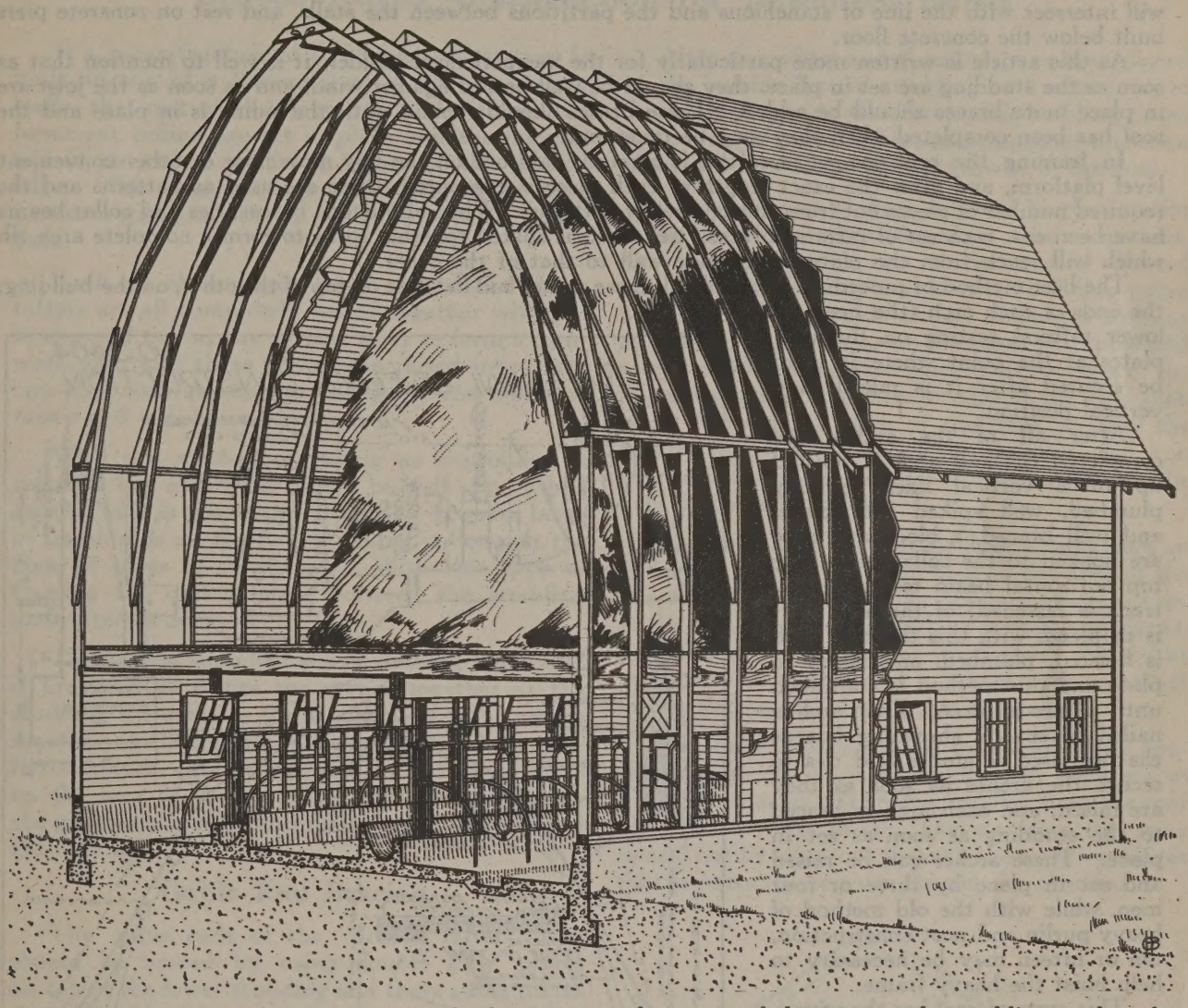
The required amount of material of each kind and for each part of the floor has been calculated separately in fractional numbers.

The last three columns of this table give the total amount required and show that for each cow stall it will take about 6¼ sacks of cement, 7/10 cubic yard of sand, and a yard of gravel.

For concrete floor we recommend a mixture of one part cement to three parts sand and five parts gravel as shown in the bottom line of the following table.

KIND OF CONCRETE			MATERIAL REQUIRED FOR FLOORS 3' 6" WIDE																		
PROPORTION OF MIXTURE			MATERIALS CONTAINED IN ONE CUBIC YARD CONCRETE			FEED ALLEY 4 FT. WIDE CONTAINS .26 CU. YD.			MANGER No. 1002 CONTAINS .41 CU. YD.			STALL FLOOR CONTAINS .324 CU. YD.			GUTTER No. 3404 CONTAINS .098 CU. YD.			LITTER ALLEY 4 FT. WIDE CONTAINS .26 CU. YD.			TOTAL BARN FLOOR PER COW STALL OF 3' 6" WIDTH 1.352 CU. YDS.		
Cement	Sand	Gravel	Sacks Cement	Cu. Yds. Sand	Cu. Yds. Gravel	Sacks Cement	Cu. Yds. Sand	Cu. Yds. Gravel	Sacks Cement	Cu. Yds. Sand	Cu. Yds. Gravel	Sacks Cement	Cu. Yds. Sand	Cu. Yds. Gravel	Sacks Cement	Cu. Yds. Sand	Cu. Yds. Gravel	Sacks Cement	Cu. Yds. Sand	Cu. Yds. Gravel	Sacks Cement	Cu. Yds. Sand	Cu. Yds. Gravel
1	2	3	6.96	.52	.77	1.8	.135	.200	2.85	.213	.315	2.25	.168	.249	.68	.051	.075	1.8	.135	.224	9.4	.703	1.04
1	2	4	6.04	.45	.89	1.7	.117	.231	2.48	.188	.364	1.96	.146	.288	.56	.044	.087	1.7	.117	.231	7.6	.612	1.22
1	3	4	5.2	.58	.77	1.35	.151	.200	2.23	.238	.315	1.68	.188	.249	.51	.056	.075	1.35	.151	.224	7.03	.790	1.04
1	3	5	4.64	.52	.86	1.21	.135	.224	1.90	.213	.353	1.50	.168	.279	.455	.051	.084	1.21	.135	.224	6.27	.702	1.16

The Superstructure



This cut illustrates the construction of a favorite type of modern dairy barn which consists of a frame structure, the frame of which is built entirely out of planking not over two inch thickness, and built on a concrete foundation which extends far enough above floor and outside ground level to prevent moisture from coming into contact with the wood sill and frame.

The sill should be well bolted on the top of the concrete foundation and the studding, which are 2x6 inch in size for barns of ordinary dimensions, and spaced 16 inches or 24 inches on center, the 24-inch spacing being preferred because any stock length of boards can be nailed thereto without waste. The studding are generally of 14 or 16 ft. lengths and have a doubled 2-inch by 6-inch plate spiked on top, which ties them together, keeps them in a straight line and forms a sill for the rafters.

The floor joist of the hay mow floor are made of 2x8 or 2x10 inch joist, as the weight may require, and are spaced the same as the studding so that the end of each joist may be spiked against the side of the studding and at the same time rest on a 2x6 ledger or "ribbon" which is notched one inch into the studding and continues the full length of both side walls with as few joints as possible. Three lengths of joist are generally required to reach from one side of the barn to the other; the ends of the middle tier of joist are spiked and lapped against the inside ends of the two outer tier of joist so that each set of joist forms a continuous tie from one side wall to the other, to take up the outward thrust of the roof, and the joist are supported under the lapped ends on a set of girders, built up out of three or four thicknesses of 2x10 or 2x12 inch joist; built up continuously from one end of barn to the other with as few lengths as possible and all end joints broken, so that there will not be more than one end joint at any one place along the length of the barn.

These floor beams are supported by posts or preferably iron columns, which are so spaced that they will intersect with the line of stanchions and the partitions between the stalls, and rest on concrete piers built below the concrete floor.

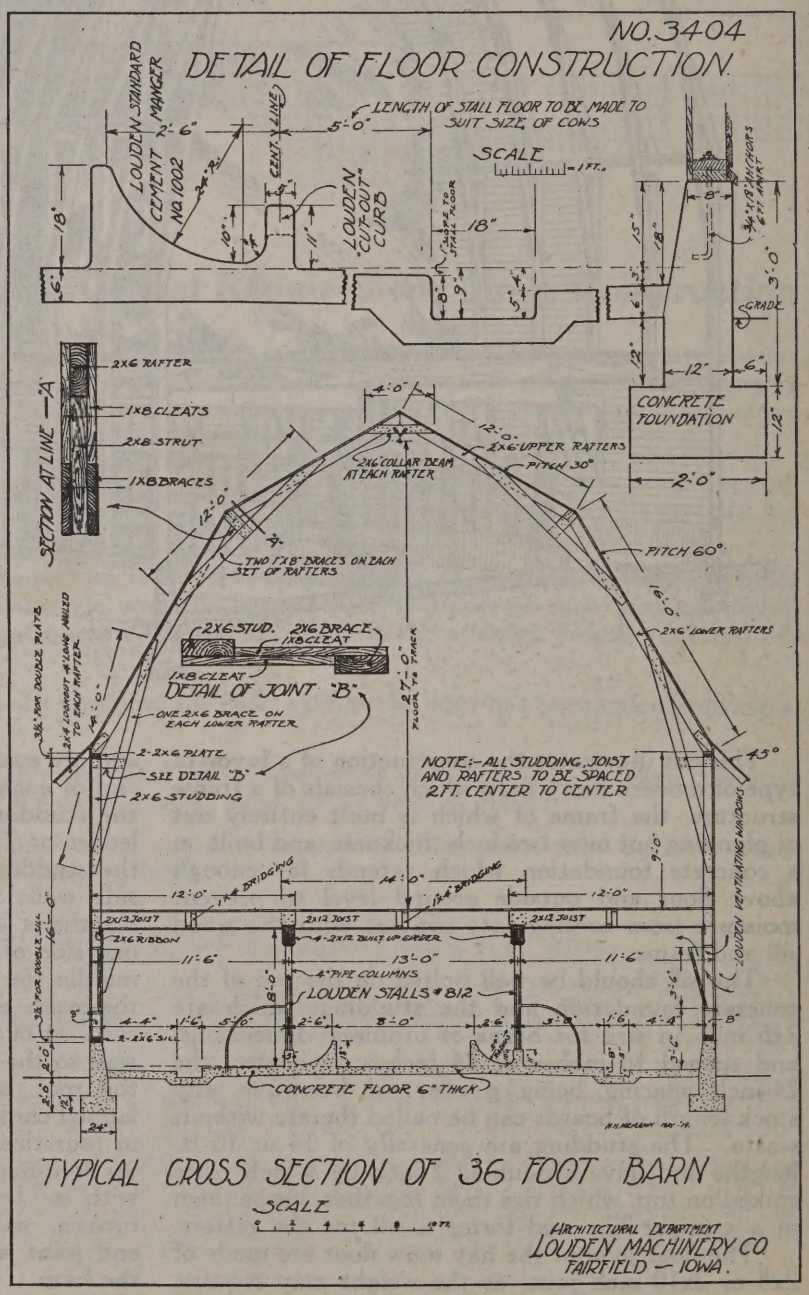
As this article is written more particularly for the inexperienced builder, it is well to mention that as soon as the studding are set in place, they should be well braced against wind, and as soon as the joist are in place more braces should be added. These braces should remain until the siding is in place and the roof has been completed, then they may be taken out.

In framing the roof one set of rafters is carefully laid out on the hay mow floor or other convenient level platform, and after the exact length of each piece is computed, these are used as patterns and the required number of pieces cut from this one set of patterns. When all rafters, braces, ties and collar beams have been cut, each set of rafters, braces, ties, etc., is spiked together so as to form a complete arch rib which will reach from the plate of one side wall to that of the other.

The best method of procedure is to build all these arches laid flat, one on top of the other, on the building, the ends of each arch (the heels of lower rafters) resting on the wall plates at the point where it is to be secured after it is raised to a vertical position.

After all of the arches are completed the end arch is hoisted up to a vertical line, perfectly plumbed, well spiked into place, and well braced, a block and rope are hooked to the collar beam (the top horizontal beam to which hay track is fastened) of the arch that is in place, with this the next arch is hoisted, plumbed, and nailed in place and this method is continued until all are in place. Each arch is nailed to several sheathing boards that are used as guides and ties to secure the arches as soon as they are raised, and each arch is braced to the studding as soon as set in place. These arches can be raised and set in place by three or four men, while with the old method of heavy purlin and post construction, ten or fifteen may be necessary to help hoist the heavy frame.

This type of roof has the advantage of requiring less material and labor than the heavy timber roof; is just as strong and forms a mow without any obstruction.



We find your goods unexpectedly satisfactory. The hay track and carrier works like a charm and the hanger and barn door tracks are past reproach. Thanking you for all past favors, I remain

Yours respectfully,
H. I. Armour,
Rising Sun, Md.

Braced Rafter Construction for Basement Barns

If a superstructure of the braced rafter type is built on top of a basement of wood or masonry walls, the joist of the floor which also forms the basement ceiling are set in place and the flooring is laid to within about 12 inches of the outside edge. This floor can then be used as a working platform upon which to build the braced rafter barn.

Each set of studding, lower rafters and upper rafters are all completely nailed together with the braces and tied at the corners so as to form a complete arch and these arches are raised into place one at a time starting at one gable end which is raised and well braced first.

With this method of raising no scaffolding is required but each arch should be well stay lathed as soon as it is raised and plumbed. It saves labor in framing as all the heavy nailing is done on the floor in place of in the air. With this type of framing the double plate between the studding and rafters is omitted.

The narrow matched siding running horizontal is preferred as it ties the arches together at the studding the same as the sheathing ties the arches together at the rafters. If vertical siding is preferred, place continuous 2x4 inch nailing girts on the face of the studding and break joints so the girts will form a continuous hoop or tie around the building.

Gable End Bracing

The gable ends of the "braced rafter" barn should be braced by using double 2x12 plates on top of the lower studding and these gable plates should be braced across the corners to the plates of the side walls with 2x10 plank or with two 2x6 nailed together so one sets on edge and the other laid flat so it will be stiffened against hay pressure.

The gable above the plate is braced by running 2x12 braces from the studding to the girders supporting the mow floor. These braces can again be braced back to the gable to counteract the hay pressure.

Ventilation Flues

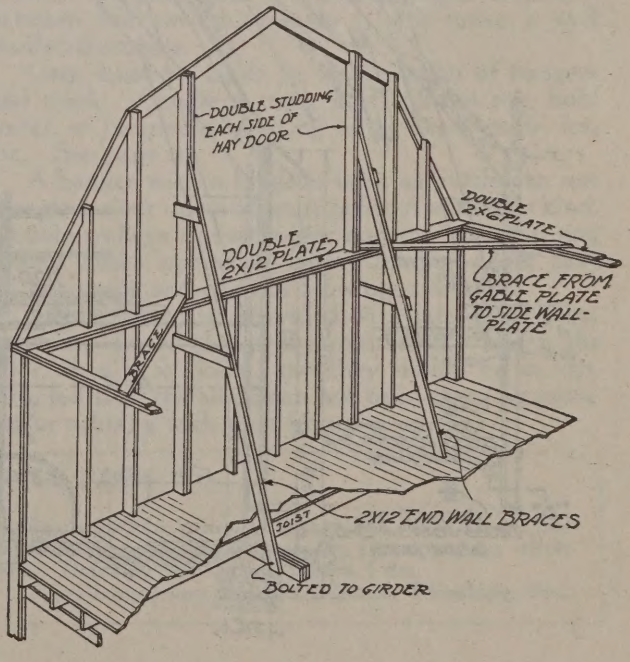
Wherever foul air flues are to be built into the side walls they may be formed by substituting 2x12 inch studding to form the sides of foul air flues in place of 2x6 inch studding: Also using 2x12 inch for the lower rafters and braces at the plate at all places in the roof containing these flues.

After the siding and sheathing has been placed on the outside face of studding and rafters, cover this surface (inside the flues) with building paper and over this paper surface place another thickness of dressed boards running lengthwise of the flues.

Close the side of flues exposed to the interior of the barn by constructing these sides in sections, by nailing together two thicknesses of dressed and matched flooring boards (with building paper between). The boards of one thickness running at right angles to those of the other thickness and after well nailed together place these sections of the flue sides against the interior edge of the 2x12 inch plank forming the sides of the flues, so that the boards forming the inside of the flue will run lengthwise and the boards on the outside of the flues will run horizontal.

The bottom of the foul air flues should have an air intake opening equal in area to the area of the flue and is to have another opening of equal area at the ceiling of the room which is to be ventilated, provided with an air tight wood cover, hinged at bottom to swing out and provided with a ratchet for regulating and closing this opening.

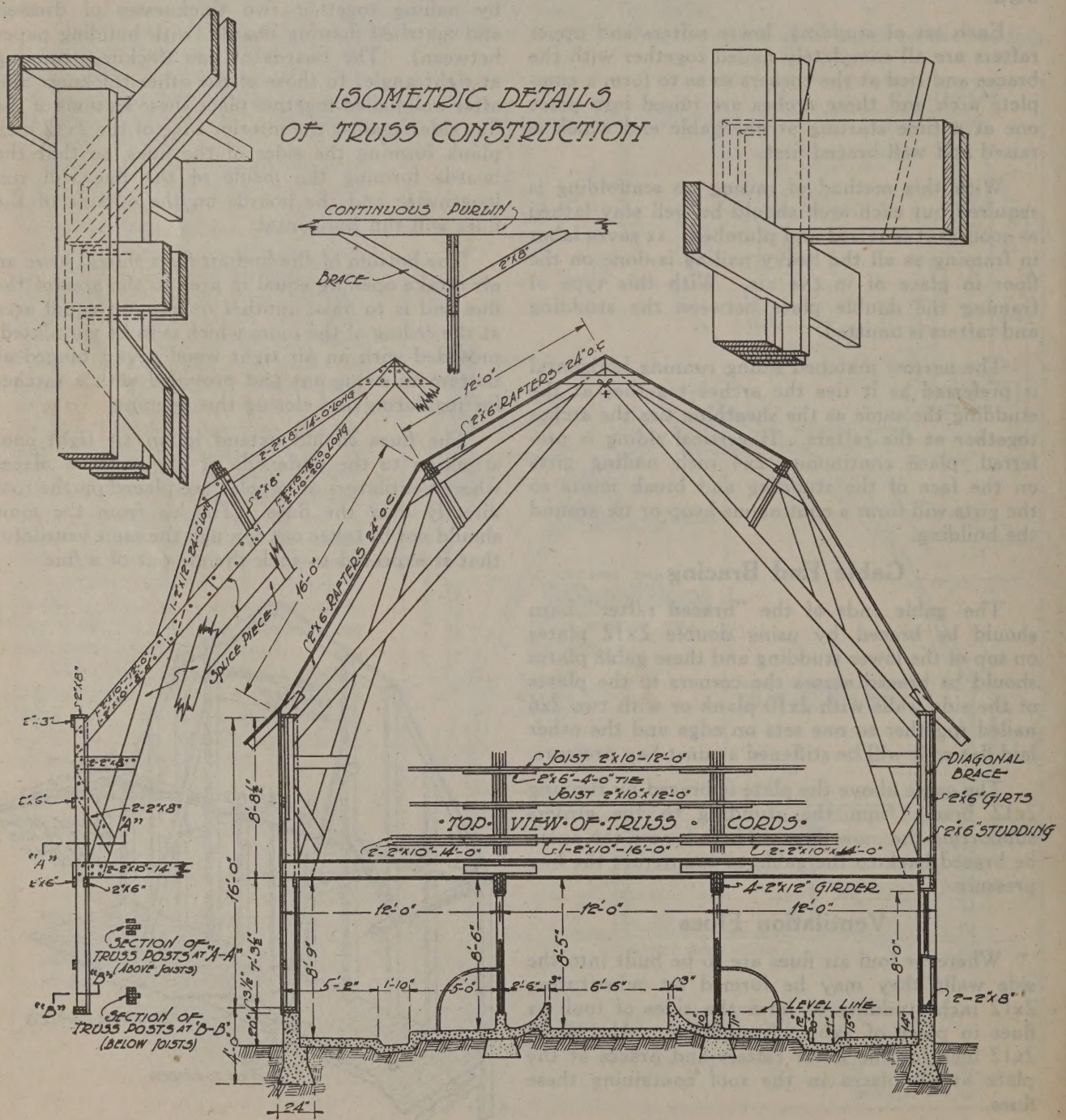
The flues should extend in an air tight construction to the underside of roof at such places where ventilators or cupolas are placed on the roof directly over the flues. The air from the mow should not be taken out through the same ventilator that is expected to suck the air out of a flue.

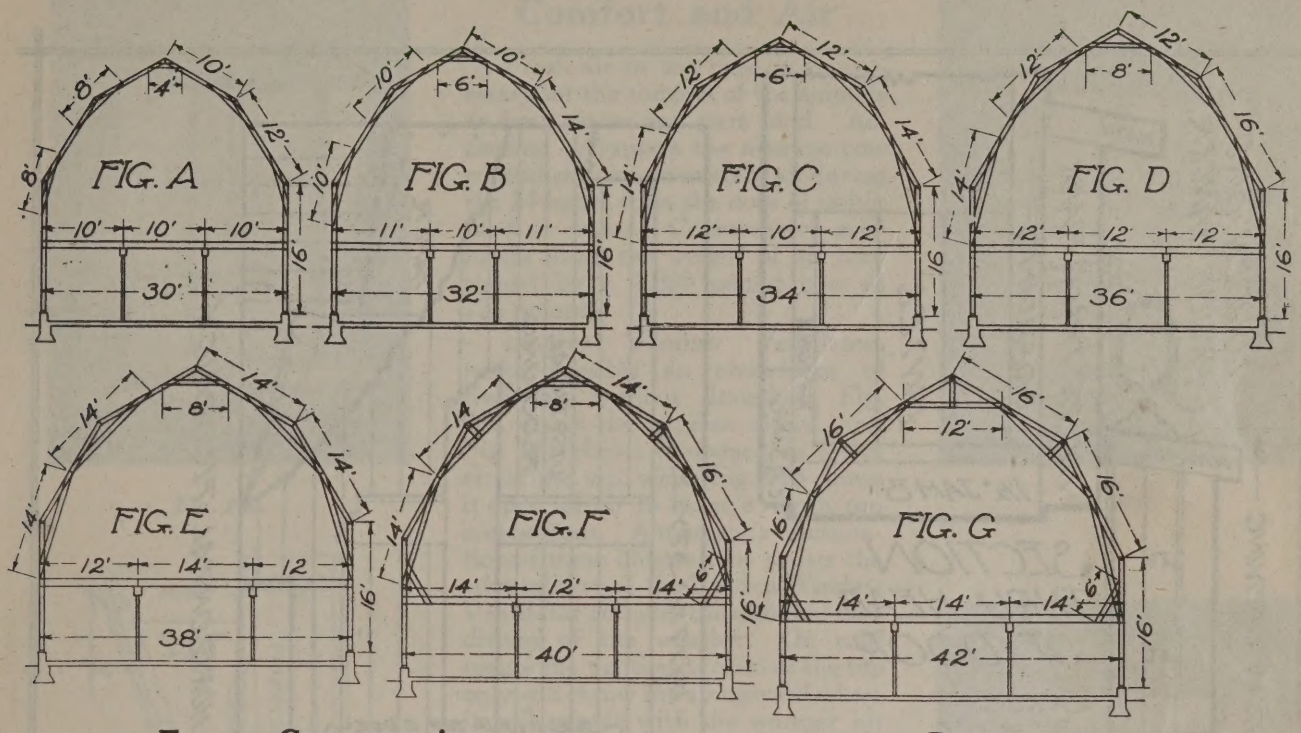


Construction of Plank Trusses

While we advocate the use of the "braced rafter" construction for gambrel roof barns because it is economy, some may prefer constructing their barn with the plank truss method by framing trusses out of heavy plank and spacing them 14 or 16 feet apart for supporting purlin beams which in turn will support the individual rafters. This truss does not require any timber over 24 feet long.

While this truss has been designed to meet requirements in the most economical way, a barn roof with this construction requires 1240 feet of lumber for one truss and roof framing it carries, if trusses are spaced 16 feet apart. The "braced rafter" construction illustrated on page 12 requires 100 feet less lumber, and lumber which is less expensive per thousand feet than that required for the trusses.





Frame Construction

The steady increase in the price of lumber and building materials has necessitated a closer calculation of their strength.

Economy prescribes that each piece shall be only as large as needed to safely withstand the strains to which it will be subject, and so placed that it will be the strongest.

In the largest and best barns built to-day you will seldom see timber thicker than two inches. This is partly due to small dealers carrying a limited assortment of sizes, and to a greater extent to the present day calculations of architects.

Most modern barns are built with self-supporting roofs, as this type of construction eliminates heavy beams and posts and reduces cost. This type of roof resembles the hull of a boat turned upside down, and consists of built up plank arches reinforced with splice-braces at angles, spanning from one side wall to the other. This roof usually has four surfaces, the lower two being steep and the upper ones about quarter pitch. Many make the mistake of calling this type a "hip-roof." The proper name is "gambrel" and it is also known as "curb roof" and "mill roof."

Doors

Sliding doors have many advantages over those attached by ordinary hinges. If properly built with a beveled check rail around the edges, they can be made practically air tight, and at the same time work free and loose as soon as opened.

Doors built up out of matched flooring are very strong, and if made double thickness with one thickness running at right angles to the other, will prevent warping, and if building paper is placed between the two thicknesses it will make a well insulated surface.

Care must be taken in the selection of hangers and track. Choose a track that will not sag, hold water, or become clogged by birds' nests, snow, ice, etc. See page 111.

A hanger with a hinge is best, as cattle can not tear your door down when it is fitted with this kind. Double trolleys run smoother and the roller bearing wheels make operation easy. Sliding doors take up less space and can not blow open or shut.

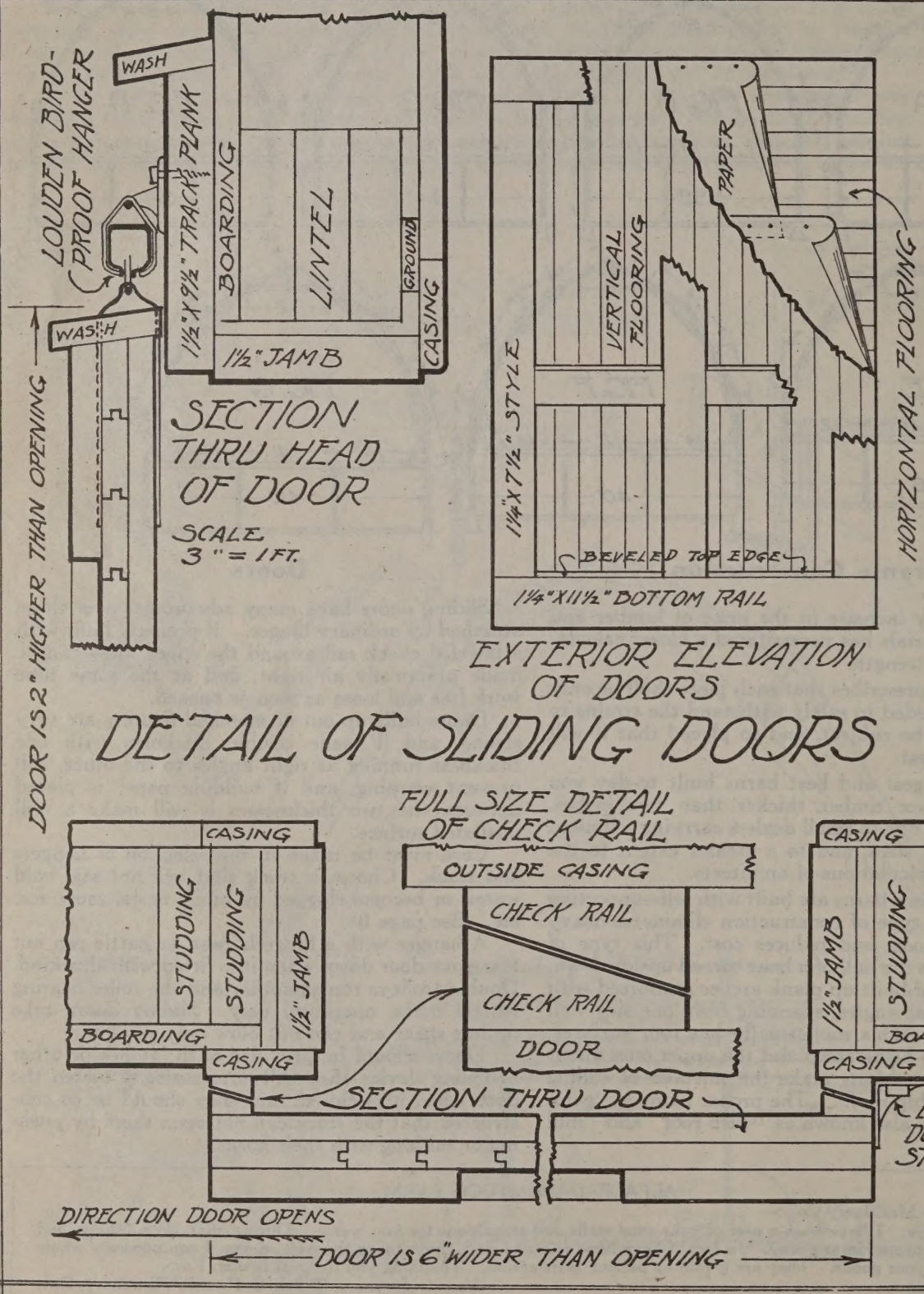
Doors should be provided with latches or other fastening device that will automatically fasten the door when it is closed, and they should be so constructed that the stock can not open them by pushing or rubbing with their horns.

ALFALFADALE STOCK FARM

The Louden Machinery Co.,

Dear Sirs: I have been a user of your steel stalls and stanchions for four years. During that time I have had no cow get injured in any way. In fact, I have liked them so well, that during the past season, I equipped my whole stable with your goods. They are giving us perfect satisfaction. Thanking you for past favors, I am,

Very truly yours, Wilber C. Prouse, Tilsonburg, Ont.


LOUDEN BIRD-PROOF HANGER
WASH
WASH
1½"X9½" TRACK
¾" PLANK
BOARDING
LINTEL
GROUND
CASING
1½" JAMB
DOOR IS 2" HIGHER THAN OPENING
SECTION THRU HEAD OF DOOR
SCALE 3" = 1 FT.
PAPER
VERTICAL FLOORING
1¼"X7½" STYLE
BEVELED TOP EDGE
1¼"X11½" BOTTOM RAIL
HORIZONTAL FLOORING
EXTERIOR ELEVATION OF DOORS
DETAIL OF SLIDING DOORS
FULL SIZE DETAIL OF CHECK RAIL
CASING
STUDDING
STUDDING
1½" JAMB
BOARDING
CASING
OUTSIDE CASING
CHECK RAIL
CHECK RAIL
DOOR
CASING
1½" JAMB
STUDDING
STUDDING
BOARDING
CASING
SECTION THRU DOOR
LOUDEN DOOR STOP
DIRECTION DOOR OPENS
DOOR IS 6" WIDER THAN OPENING

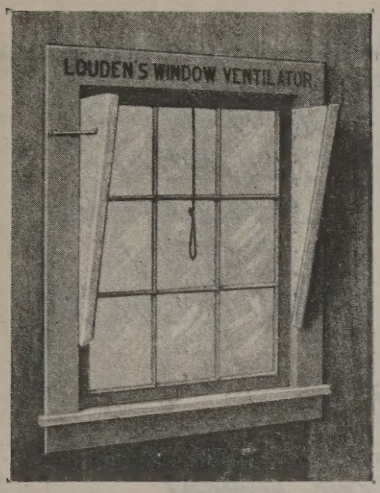


Fig. 986.

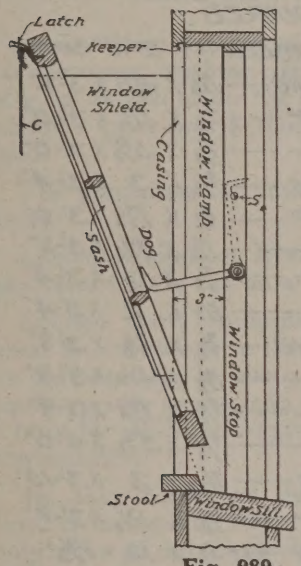


Fig. 989.

Comfort and Air

Fresh air in the barn is as necessary for the comfort of the animals as fresh water and pure food. According to experts the average cow consumes more **pounds** of air during the 24 hours than she does of either food or water. Conservative estimates place the weight of air consumed by a 1,000 pound cow at 224 pounds.

Louden Window Ventilators make possible an abundance of fresh air without draughts. Fig. 986 shows the window closed, and Fig. 987 shows it opened to let in air at the top, while Fig. 988 shows it open for air to enter at both top and bottom. A moment's examination of these illustrations shows the adaptability of the Louden Window Ventilator to meet the different conditions of the weather. On cold nights the ventilator open at the top only will throw the air upward where it will mingle with the warmer air before coming in contact with the cows.

When it is necessary to keep the cows in the barn on warm nights the arrangement of the window in Fig. 988 will give a cooling and comforting active circulation of air throughout the barn.

Fig. 989 is a vertical section showing the sash and the top and bottom of the window frame cut in two and the sash open and slightly raised. Write for special booklet.

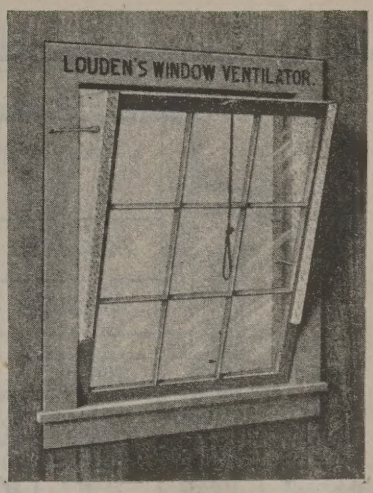


Fig. 987.

Fig. 988.

Louden Machinery Company,

Gentlemen:

I want to say in regard to the Dairy Barn Equipment purchased of you last year, and installed according to your very thorough instructions furnished with job, that everything has proven entirely satisfactory and has been exactly as represented.

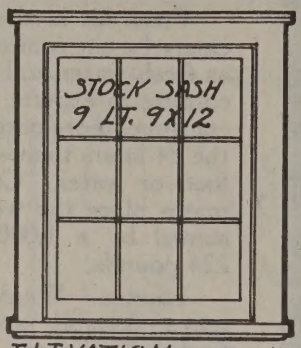
If I were to buy equipment again I would make no changes. We have in constant use Stanchions and Litter Carrier, (the latter being the Emancipator and the best carrier I have ever seen); also the feed truck which we find fully as useful and essential as the rest. A neighbor after seeing my truck ordered one like it from you and now does not see how he ever fed ensilage without it.

We are very much pleased with our entire equipment which has transformed a useless basement into a modern dairy barn. In closing I wish to say to you as a business firm that I appreciate also the interest manifested on your part in the adjustment of freight overcharges, etc.

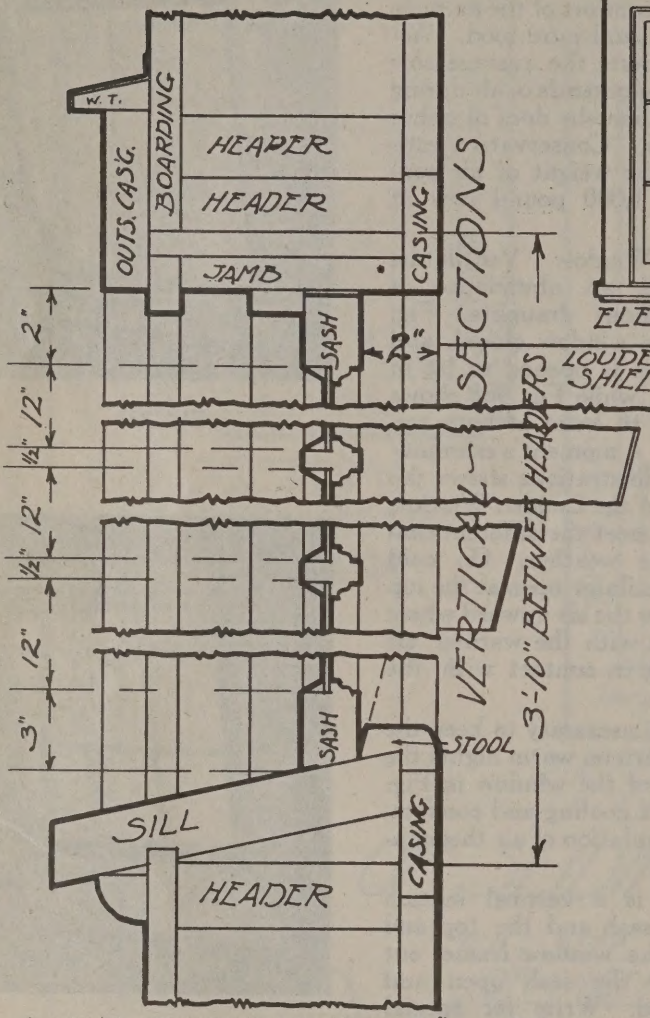
Any intending purchaser who would call at our farm would get a better idea of the success of the equipment than simply by reading testimonials, and would be welcome at all times.

Yours truly,
Mr. E. C. Barrick, Proprietor,
Fairview Stock Farm,
Janesville, Iowa

DETAIL OF LOUDEN VENTILATING BARN WINDOWS



ELEVATION SCALE 1½" = 1 FT.

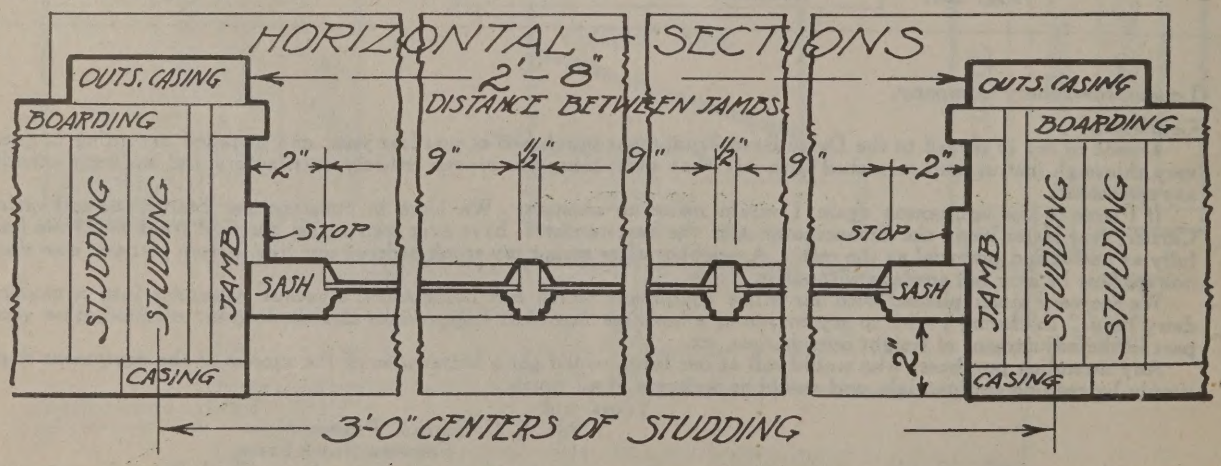


SCALE OF SECTIONS = 3" = 1 FT.

LIST OF MATERIAL REQUIRED FOR ONE WINDOW

ALL PIECES ARE LISTED SEVERAL INCHES LONGER THAN EXACT LENGTH REQUIRED

1	PIECE WATERTABLE	3'-8" LONG.
1	" HEAD OUT. CASING	1⅛" X 4½" X 3'-6"
1	" " BLIND STOP	⅞ X 1½ X 3'-0"
1	" " JAMB	⅞ X 5⅝ X 3'-0"
1	" " INS. CASING	⅞ X 3 X 3'-4"
1	" " OUTS. STOP	½ X 1⅜ X 3'-0"
1	" SILL	1½ X 7½ X 3'-8"
1	" APORN	⅞ X 3 X 3'-4"
1	" STOOL	1⅛ X 2 X 3'-4"
1	" QUARTER ROUND	⅞ X ⅞ X 3'-8"
2	" OUTS. CASING	1⅛ X 4½ X 3'-9"
2	" BLIND STOP	⅞ X 1½ X 3'-9"
2	" JAMB	⅞ X 5⅝ X 4'-0"
2	" INSIDE CASING	⅞ X 3 X 3'-10"
2	" OUTS. STOP	½ X 1⅜ X 3'-8"
1	SINGLE SASH 9 LT. 9 X 12 - 1⅞"	



Tables of Strength of Materials

COLUMNS.

Nominal Size Inches	External Diameter Inches	Thickness Inches	Weight per foot	Area of Section	Safe Load in Pounds for Gas-pipe Columns — Length in Feet					
					7	8	9	10	12	14
¾	1.05	.113	1.13	.424	806	.....	.....	.....	.....	.....
1	1.31	.134	1.67	.562	2181	1600	.....	.....	.....	.....
1¼	1.666	.140	2.26	.846	4549	3740	3183	.....	.....	.....
1½	1.875	.145	2.69	.983	6391	5300	5136	4448	.....	.....
2	2.375	.154	3.67	1.29	9314	8591	7914	7193	.....	.....
2½	2.875	.204	5.77	1.59	12537	11800	11020	10420	.....	.....
3	3.5	.217	7.55	2.26	19165	18280	17500	16700	15040	.....
3½	4.	.226	9.05	2.59	22860	22040	21320	20500	18780	17240
4	4.5	.237	10.73	3.33	30103	28900	28220	27300	25440	23560
4½	5.	.247	12.49	3.73	34502	33560	32660	31760	29800	27960
5	5.563	.259	14.56	4.17	38906	37520	37520	36520	34620	32520
6	6.625	.280	18.77	5.57	54055	50120	50120	50120	48780	46640
7	7.625	.301	23.41	7.18	70938	64620	64620	64620	64620	62640
8	8.625	.322	28.35	8.14	81278	73260	73260	73260	73260	73260

Louden barn equipment is an economy for the owner of three cows and ten acres of land, as well as for the owner of three hundred cows and a thousand acres of land.

The percentage of labor saved is the same.

Louden equipment is an economy for any farm that is run on a business basis.

Louden barn equipment is just as great an advantage to the man who has an old barn that he wants to remodel or equip, as it is to the man who is building a barn for which he wants every possible convenience.

In this book we but briefly mention, in a general way, the benefits of only a few of our products. We merely wish to give you an idea of our business and we want to send you free special catalogs on any or all the lines in which you are interested.

Conscientious advice, the result of 50 years of barn equipment manufacturing experience is at your service.

TABLE 1.

Safe Load in Pounds Uniformly Distributed for Yellow Pine Beams Supported at Both Ends.

Span in Feet	SIZE OF BEAM — Dressed to the following sizes						
	2x6	2x8	2x10	2x12	2x14	2x16	2x18
	1⅝x5⅝	1⅝x7½	1⅝x9½	1⅝x11½	1⅝x13½	1¾x15½	1¾x17½
6	1714	3047	4488	7163	9872	14020	17846
8	1285	2285	3666	5372	7404	10515	13398
10	1028	1828	2933	4298	5923	8412	10718
12	857	1523	2444	3582	4936	7010	8932
14	734	1306	2095	3070	4231	6008	7656
16	642	1142	1833	2686	3702	5256	6699
18	.....	1016	1629	2388	3291	4505	5954
20	.....	914	1466	2149	2961	4206	5359
22	.....	.....	1333	1954	2692	3823	4872
24	.....	.....	1222	1791	2469	3505	4466
26	.....	.....	.....	1653	2278	3235	4122
28	.....	.....	.....	1535	2115	3804	3828
30	.....	.....	.....	.....	1974	2804	3572
32	.....	.....	.....	.....	1851	2628	3349

Note:—The above loads are calculated for a fiber stress of 1,800 pounds per square inch, safety factor 4. Modulus of rupture 7,200 pounds per square inch.

Loads above heavy horizontal lines calculated for both strength and stiffness.

Loads below heavy horizontal lines are for strength only and will deflect more than one thirtieth of an inch per foot of span and should not be used with plastered ceilings.

Louden Machinery Company,
Gentlemen:

I have been using your equipment in my certified dairy barn for about six months and have put it to the test every way we knew how, but find everything stands the test and should last a lifetime. Every part of the equipment is perfectly satisfactory and comes up to the standard that every one should expect when he is buying the best. I find that I can keep a herd of cows in shape to produce certified milk cheaper with the Louden equipment than I could keep cows in the old fashioned way for producing the cheapest grade of market milk.

I might state that I am in the dairy business for the dollar. My equipment ran into four figures and I count it the best spent money I put into my dairy barn.

BLAIR B. HILEMAN, Prop.,
Pleasant Valley Stock Farm, Altoona, Pa.

Some of the Fundamentals of Ventilation

Ventilation may be divided into two classes — forced and natural. Forced ventilation requires blowers to force the air in or exhaust fans to draw the air out of the place to be ventilated. Forced ventilation is used in mines and sometimes in large buildings, but on account of its expense it is not adapted to ordinary dwelling houses or farm buildings. Natural ventilation depends upon natural laws, and all it requires is the arrangement of the building to permit the free operation of those natural laws.

A still further division might be made of warm and cold weather ventilation, because each has its special requirements. Warm weather ventilation is easy. About all that is necessary is to open the building so the natural currents of air will pass through. The Louden Ventilating Windows have been particularly designed for warm weather ventilation, and meet all requirements. They should be used when the temperature outside becomes as warm or warmer than the air in the barn. In cold weather it is necessary to preserve, as far as possible, the warmth of the building, and to do this and at the same time secure efficient ventilation is the problem. The only absolutely perfect ventilation is out of doors where there are no walls or ceilings to interfere with the free movements of the air.

To overcome the interference of walls and ceilings, which are necessary to preserve the warmth of the building in cold weather, and secure the largest amount of ventilation obtainable under the circumstances, it is necessary that certain requirements be strictly complied with. To better understand these requirements it will be well to briefly consider the underlying principles governing air currents, and upon which ventilation is founded. Like everything else in nature, it is extremely simple when we once understand it, but extremely mystifying when we do not understand it. The "wind bloweth where it listeth" may seem to convey the idea that it is irresponsible or not subject to any definite rules of action, and yet there is nothing that is more instantaneously responsive to natural laws.

Heat and cold are the impelling forces behind every current of air. Heat expands and cold contracts air, as well as other things. The warm expanded air will be lighter than an equal volume of cold contracted air, and like the light boy on the teeter board, it will go up, while the cold air, like the heavy boy, will go down. The teeter board, however, is a clumsy illustration of the extremely mobile movements of the air currents. That cold air descends and rushes in to displace the heated air which ascends or is forced up, tells the story of all the air currents which have ever fanned the face of the earth, from the slightest zephyr to the mightiest tornado. It is the **key-note** of all forms of ventilation.

Out of doors every discernible current of air, and also those not discernible, are simply never ending efforts of nature to preserve a uniform temperature. Out of doors the warmest place is at the ground, and as you go up the air becomes imperceptibly cooler until several miles high it becomes as cold as an Arctic winter, in warm as well as cold weather. This condition is natural, and is necessary to the continual purification of the air. Indoors the order is largely reversed. In a room having a stove and tight ceiling it is the warmest at the ceiling and the coldest at the floor. Sometimes the difference in temperature is as much as 20 degrees. Under such conditions, with the impurities of respiration and the carbonic acid gas generated by the stove retained in the room, the wonder is that colds and tuberculosis are not more frequent.

The problem is to preserve the warmth of the room in winter and at the same time to keep the air fairly pure and about as warm at the feet as at the head as it is out of doors and should be indoors.

Many systems of ventilation have been designed and quite a number give very good results. The most popular at the present time is the "King System" designed by Prof. F. H. King. This system is composed of air flues arranged according to the following order:

The King System

Fresh air flues are provided in the side walls; starting just high enough above the ground to keep snow from closing them up, they have intakes protected by a wire mesh to keep out birds and the flues run up to the ceiling to a damper located so the fresh air will enter the barn at the ceiling and always in front of the cows' heads.

Foul air flues should start on the inside near the floor and end in a flue above the roof. The air outside being colder and heavier than the air in the room, it will tend to rush in and replace the warmer and lighter air of the room, which will be forced through the outlets to mingle with the cold air above the roof.

The pure cold air coming in at the ceiling will mingle with the warmest air in the room, and will be warmed to a considerable extent before reaching the floor. By this means the air of the room will be purified but will not be chilled as much as it would be if it was admitted through an open door or window.

It may seem that on this arrangement there is a reversal of the natural law that cold air descends and heated air rises, but it is only apparent, or, in other words, going a short distance backwards to get around an obstacle and reach the desired end.

It is well known that water will rise in the short end of a siphon, apparently in opposition to the laws of gravitation, to go a further distance down in the long end of the siphon. These ventilating flues are constructed on the principle of an inverted siphon. The cold air will rise a short distance up to go a longer distance down, and the warm air will go a short distance down to get a greater distance up. The principle is the same as the teeter board, which sends the light boy up, apparently in violation of the laws of gravity, in order that the heavy boy may go down in obedience to the same law.

This arrangement to work successfully must be right in every respect. No person would go back around-about to get to a place if he could go straight ahead. The cold air will not go up in a flue to get in a building if it can get in below through an open door or window, or through cracks in the siding. Neither will the warm air go down near the floor to get out of the building if it can get out through the ceiling or through openings in the upper parts of the wall. Any cracks or crevices in the flues will also be detrimental. It is an old and a true saying that "A fountain will never rise higher than its head," but it is equally true that it will never rise that high unless compelled to do so. The air will never pass through these ventilating flues if there are more direct ways for it to go. There should be no abrupt shoulders or corners in the flues to obstruct the passage of the air, and the air should be enough warmer and lighter in the building than outside to cause it to travel the round-about way through the ventilating flues. When the temperature inside and out is about the same, this system of ventilation will not work, because there is not enough difference in the weight of the inside and outside air to force the round-about passage it has to take.

In dairy barns where no artificial heat is used and where the difference in temperature will not be so great, it is even more important to have everything just right. Especial care should be taken to have the barn built as close and as warm as possible, to make these ventilating flues work to the best advantage. If the lower parts of the outlet flues were made of sheet iron so there would be no danger

Continued on Page Twenty-two

Table of Fresh Air Supply and Ventilation

Prof. F. H. King has computed the amount of pure air which must be breathed to supply the oxygen needed by different animals, as shown in the following table, and we have added the last two columns, which show the area of vent flues that are required per head for a current of air flowing through the vent flues at the rate of 295 feet per minute, and 200 feet per minute, respectively.

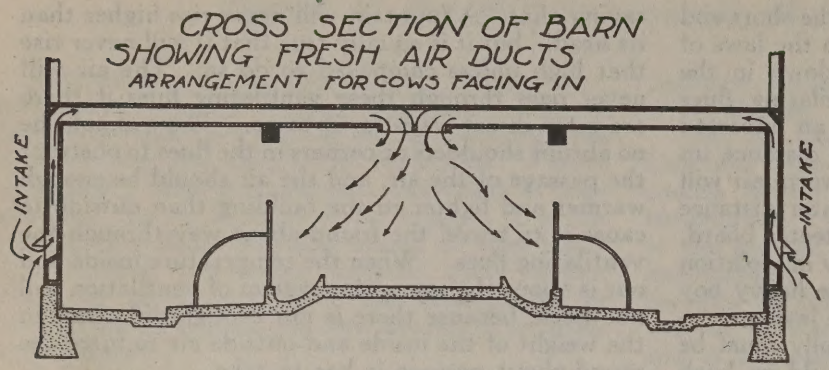
If the vent flue is less than 30 feet in height, column 7 should be used, and if over 30 feet high, column 6 may be used:

	1	2	3	4	5	6	7
	Cubic ft. of Air Breathed in 24 hours		Pounds of Oxygen Consumed in 24 hours		Cu. ft. Air Supply Per Hour Per Head	Flue Area Per Head Air Flowing 295 ft. per min. Inches	Flue Area Per Head Air Flowing 200 ft. per min Inches
	Per 1000 lbs. Animal wt.	Per Head	Per 1000 lbs. Animal wt.	Per Head			
Man	2833	425	12.207	1.831	537	4.22	6.43
Horse	3401	3401	13.272	13.272	4296	34.84	51.55
Cow	2804	2804	11.04	11.04	3542	28.80	42.48
Swine	3753	1103	29.698	4.456	1392	11.38	13.12
Sheep	7260	726	29.314	2.931	917	8.35	10.94
Hen	9667	29	23.84	.075	35	.28	.43

Table of Area and Size for Vent Flues in Inches

The following table shows the area and size of vent flues required for various kinds and number of stock, calculated with the air in the vent flues flowing 200 feet per minute:

Number Head of Stock	KIND OF STOCK											
	MAN		HORSE		COW		SWINE		SHEEP		HEN	
	Area	Size	Area	Size	Area	Size	Area	Size	Area	Size	Area	Size
1	8	2 x 4	54	6 x 9	44	4 x 11	16	4 x 4	12	3 x 4	1	1 x 1
2	14	2 x 7	108	9 x 12	88	8 x 11	27	3 x 9	22	2 x 11	1	1 x 1
3	20	4 x 5	156	12 x 13	128	8 x 16	40	5 x 8	33	3 x 11	2	1 x 2
4	27	3 x 9	216	12 x 18	170	10 x 17	54	6 x 9	44	4 x 11	2	1 x 2
5	32	4 x 8	264	12 x 22	216	12 x 18	66	6 x 11	55	5 x 11	3	1 x 3
6	40	5 x 8	312	12 x 26	264	12 x 22	80	8 x 10	66	6 x 11	3	1 x 3
7	45	5 x 9	360	12 x 30	300	12 x 25	92	8 x 12	77	7 x 11	3	1 x 3
8	54	6 x 9	420	12 x 35	352	16 x 22	108	9 x 12	88	8 x 11	4	2 x 2
9	60	6 x 10	468	12 x 39	384	16 x 24	120	10 x 12	99	9 x 11	4	2 x 2
10	64	6 x 8	516	12 x 43	416	16 x 26	132	11 x 12	110	10 x 11	5	2 x 3



of fire, and gas jets were placed in them, it would help to create the draft necessary to make the strongest current. This would be especially advantageous in the early spring or late fall months when there is but little difference in the temperature of the air inside and outside the building. During the warmer months these ventilating flues will be but little use, and a more direct system of ventilation should then be used.

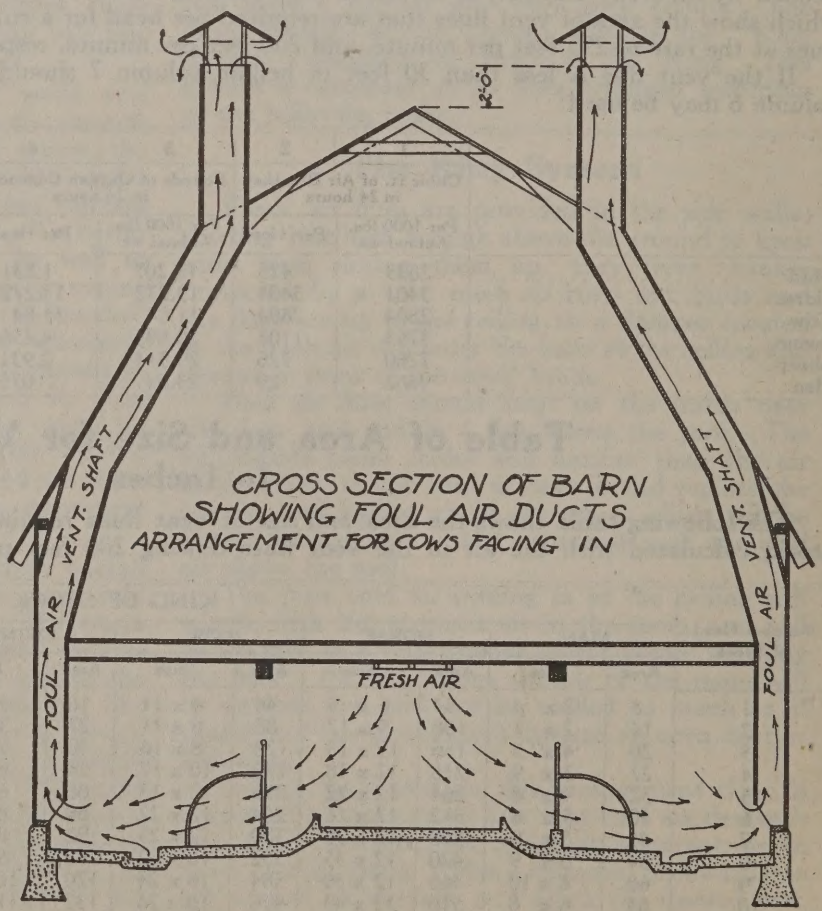
One of the worst things to be contended with in dairy barns during the winter months is the humid state of the atmosphere and its condensation on the walls and ceiling of the building. This is due to a lack of proper ventilation, and is aggravated by the lack of proper insulation. Warm air will carry a larger amount of moisture than cold air, and when it is brought in contact with a cold surface the moisture will be precipitated, and will form in drops of water on the ceiling and on the walls. A warm barn with an active circulation of the air through the ventilating flues is the best thing for this condition. There is a lot of moisture in the cows' breath, and when the ventilating currents are sluggish and the temperature is chilly, this "sweating process" will be increased.

Open doors and windows cannot be used at the same time with the ventilating flues, because the interchange of air currents will take place through the doors and windows instead of the ventilating flues, because the air will always take the most direct course. If the ventilating flues are properly arranged and proportioned (the nearer air tight the building is, the better) the more perfectly the ventilation will work.

The essential points required for perfect results with this system of ventilation are as follows:

The room must be as near air tight as is practical to make it. Walls and ceiling should be insulated from outside temperature by lining with heavy building paper, matched lumber or other non-conducting material. The foul air vent shafts must start near the floor and run up at least two feet above highest point of roof. Should be smooth on inside. Can be changed from oblong to square or round, but area must remain the same the entire length. It should be as near vertical as possible and avoid all sharp bends and horizontal runs. It should be air tight and insulated from outside temperature. Should have rain proof top, and intake should be located behind cows so that all foul air will be drawn away from cows' heads.

Fresh air ducts should also be insulated, smooth inside, of about equal area the entire length and outside air intakes should be as far below the outlet at ceiling as is practical, for the reason that if intake was level with outlet in the ceiling, the warm air near the ceiling would escape, reversing the flow of air and exhausting the heat in place of letting in fresh air.

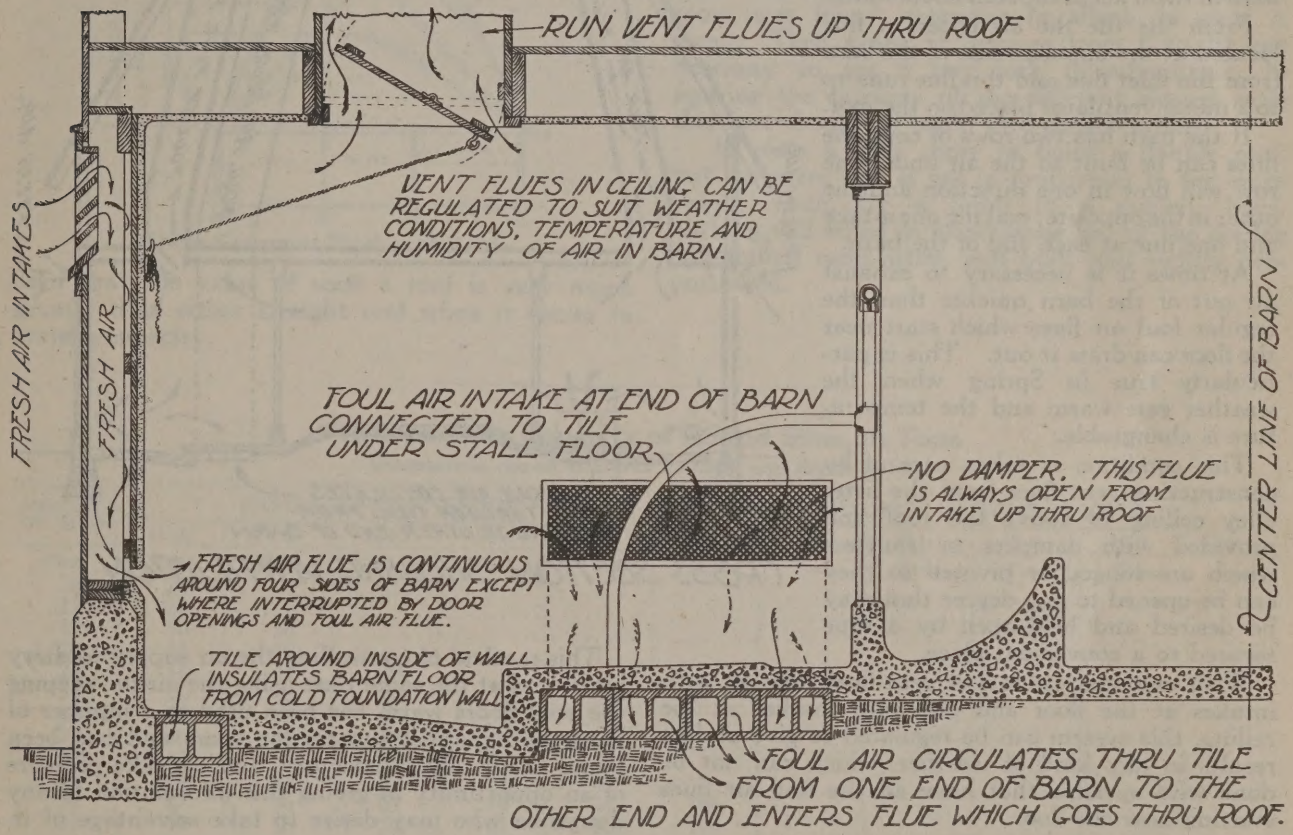


Fresh air should always enter the room near the ceiling, and entrance of air should always be located in front of cows so the air will flow towards the cow and form a current passing beyond the cow, towards the foul air shaft, absorbing all impurities in its path.

Fresh air ducts should be well and equally distributed along the ceiling of feeding alley; a number of small ducts are better than one large duct of equal area. Foul air vents can be made larger and less in number.

Foul air vent ducts take up least amount of room and are cheapest to build if built into the outside walls as shown in this sketch and fresh air ducts can be run to center of ceiling (between joists) as well as not. For this reason we recommend cows be stanchioned facing in.

Another Good System of Ventilation


RUN VENT FLUES UP THRU ROOF
VENT FLUES IN CEILING CAN BE REGULATED TO SUIT WEATHER CONDITIONS, TEMPERATURE AND HUMIDITY OF AIR IN BARN.
FRESH AIR INTAKES
FRESH AIR
FOUL AIR INTAKE AT END OF BARN CONNECTED TO TILE UNDER STALL FLOOR
NO DAMPER. THIS FLUE IS ALWAYS OPEN FROM INTAKE UP THRU ROOF
CENTER LINE OF BARN
FRESH AIR FLUE IS CONTINUOUS AROUND FOUR SIDES OF BARN EXCEPT WHERE INTERRUPTED BY DOOR OPENINGS AND FOUL AIR FLUE.
TILE AROUND INSIDE OF WALL INSULATES BARN FLOOR FROM COLD FOUNDATION WALL
FOUL AIR CIRCULATES THRU TILE FROM ONE END OF BARN TO THE OTHER END AND ENTERS FLUE WHICH GOES THRU ROOF.

With this system of ventilation the entire exterior walls of the lower story are used for the fresh air flues.

The air enters the wall from the outside through openings located between the windows and near the ceiling height of the lower story. These inlet openings can be constructed with slats as shown in the cut so as to make them rain proof, and on the inside face of the slats a wire mesh is nailed to keep out birds.

The boarding on the inside face of the studding is kept one inch away from the studding by first nailing horizontal 1x4 inch strips on the studding and the boarding nailed to these strips. The object of this is to allow the air to pass from the space between the two studding which contains the fresh air intake to all the spaces between all other studding.

From each of the air spaces between all studding the entire length of both sides of the barn, the air is taken into the room from a continuous slot just above the sill. See cut.

Solid concrete is not a good insulation against cold, in fact, it makes a good conductor of cold. It is a general practice to lay the cement floor of a barn directly against the outside wall, which in winter will conduct the cold to the floor and the floor will absorb the cold and gradually the entire floor will be cooled by its being in direct contact with the outside wall.

To keep the floor warm it is therefore necessary to keep it away from the outside wall. This is

done by laying a row of hollow tile between the wall and the floor.

This tile is still more effective if used for a vent flue so that there will be a circulation of warm air through it.

The foul air in leaving the room passes into a flue which starts about eighteen inches above the floor and runs down to a row of tile running from one end of the barn to the other, directly under the cow stalls. This tile with the circulation of warm air from the barn in them keeps the stall floors warm.

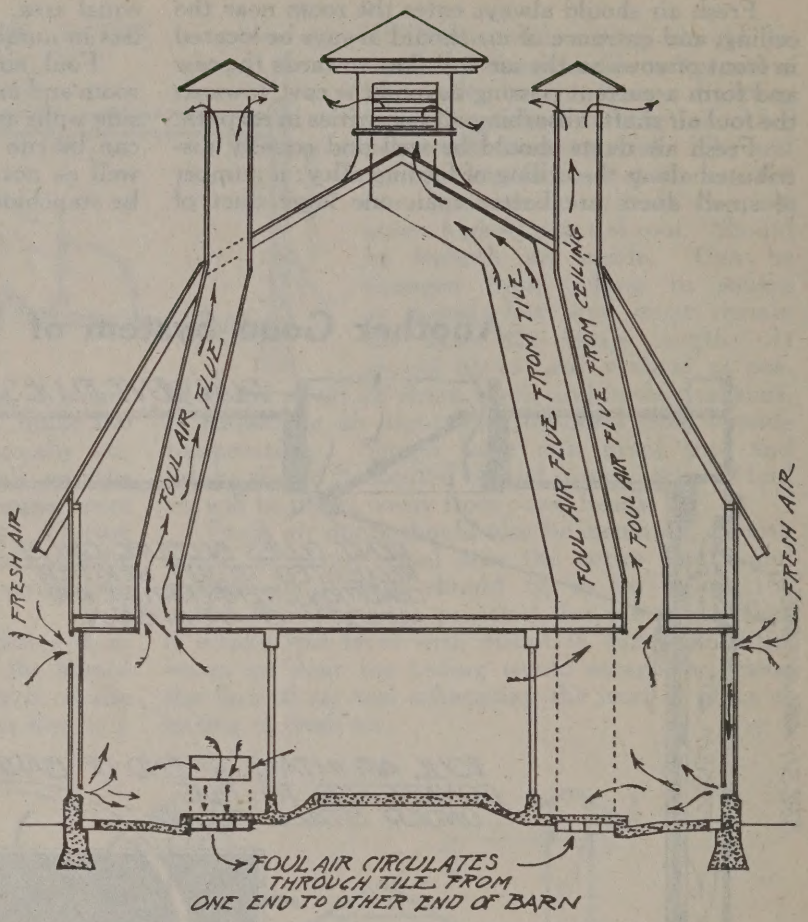
From the tile the air enters a flue located at the opposite side of the barn from the inlet flue and this flue runs up to a metal ventilator placed on the roof.

If the barn has two rows of cows the flues can be built so the air under one row will flow in one direction and the other in the opposite; making one intake and one flue at each end of the barn.

At times it is necessary to exhaust air out of the barn quicker than the regular foul air flues which start near the floor can draw it out. This is particularly true in Spring when the weather gets warm and the temperature is changeable.

This condition is taken care of by constructing vent flues from the litter alley ceiling to above the roof and provided with dampers or shutters which are hinged or pivoted so they can be opened to any degree that may be desired and held open by a rope secured to a convenient place.

With two separate sets of vent flues; one set with intakes at the floor and one with intakes at the ceiling, this system can be regulated to give perfect results in any kind of weather, which can not be done with systems that have all the foul air flues starting near the floor.


FRESH AIR
FOUL AIR FLUE
FOUL AIR FLUE FROM TILE
FOUL AIR FLUE FROM CEILING
FRESH AIR
FOUL AIR CIRCULATES THROUGH TILE FROM ONE END TO OTHER END OF BARN

CROSS SECTION SHOWING VENTILATION

This method of controlling the air supply to dairy barns and at the same time using the air for keeping the stall floors warm has been used in a number of barns with perfect success for years and has been found absolutely satisfactory, and we take pleasure of an opportunity in giving this information to any dairyman who may desire to take advantage of it.

Louden Barn Plan Competition Dinner for students of the Manitoba Agricultural College, Winnipeg, Canada

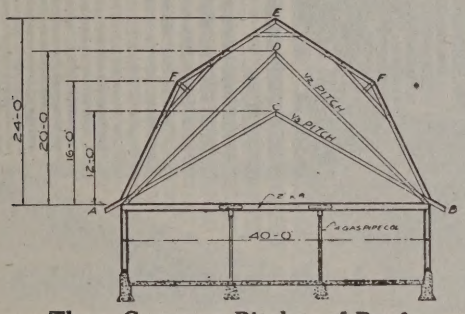
A Canadian Banquet

Each year the students of the government Agricultural College at Winnipeg, Canada, hold a Barn Planning Contest under the supervision of Prof. L. E. Smith, Professor of Engineering. Cash prizes for the best plans are offered by the Louden Machinery Company, and after the close of the contest a banquet is given to the contestants by this company.

This year the banquet was graced by the presence of the Deputy Minister of Agriculture, Prof. Bedford, who made an address and presented the prizes to the successful contestants.

About Barn Roofs

The accompanying illustration shows three ordinary roofs. The third pitch was the old style used almost universally a hundred years ago, shown at C. This gives mow room 12 feet deep at the peak above the plate line in a barn 40 feet wide. The half pitch roof shown at D gives 20 feet mow room in the center above the plate, while the roof shown at E gives a height of 24 feet in the center and 16 feet at FF. It will readily be



Three Common Pitches of Roofs

seen that the value of such a roof is very much greater than either straight roof when it comes to storage capacity.

Besides the advantage of increased storage, the larger roof is right when it comes to turning water. The upper part is not very steep. The upper roof is short and it is not necessary that it should be steep, because there is very little accumulation of water. The lower portion of the roof drops away quickly. This is exactly the reverse of the old style lean-to, where the addition sloped away and held a large amount of water to rot the shingles.

The advantage of a double roof pitch was never appreciated until hay forks came into general use to put hay and sheaves up into the loft in such quantities and so quickly that considerable storage room was found necessary in which to mow it away. Then again, it requires from 8 to 10 feet headway to use a hay fork to advantage. In figuring the capacity of the different shaped roofs this fact should be taken into consideration.

It costs a little more to build a double roof, but the extra cost is not in proportion to the extra value. Then, for a finish to a modern barn, nothing will equal in appearance one of the double or gambrel roofs when well built and rightly proportioned.

Approximate Capacity of Round Silos, in Tons

Diameter is shown at top of column, and depth at left.

HEIGHT OF SILO	INSIDE DIAMETER OF SILO, IN FEET; AND CAPACITY IN TONS (2,000 lbs.)										
	10 ft.	11 ft.	12 ft.	13 ft.	14 ft.	15 ft.	16 ft.	17 ft.	18 ft.	19 ft.	20 ft.
Feet	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
20	26	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
21	28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
22	30	36	.....	.....	.....	.....	.....	.....	.....	.....	.....
23	32	39	.....	.....	.....	.....	.....	.....	.....	.....	.....
24	34	41	49	.....	.....	.....	.....	.....	.....	.....	.....
25	36	43	52	.....	.....	.....	.....	.....	.....	.....	.....
26	38	46	55	64	.....	.....	.....	.....	.....	.....	.....
27	40	49	58	68	.....	.....	.....	.....	.....	.....	.....
28	42	51	61	71	83	.....	.....	.....	.....	.....	.....
29	44	54	64	75	87	.....	.....	.....	.....	.....	.....
30	47	56	67	79	91	105	.....	.....	.....	.....	.....
31	49	58	70	83	96	110	.....	.....	.....	.....	.....
32	51	62	74	86	100	115	131	.....	.....	.....	.....
33	53	65	77	90	105	121	138	.....	.....	.....	.....
34	56	68	80	94	109	126	143	162	.....	.....	.....
35	58	70	84	98	114	132	149	169	.....	.....	.....
36	61	73	87	102	118	136	155	176	196	.....	.....
37	63	76	90	106	123	142	161	183	204	.....	.....
38	66	79	94	110	128	148	167	191	212	237	.....
39	68	82	97	115	133	154	174	198	221	247	.....
40	70	85	101	119	138	160	180	205	229	256	280
41	72	88	105	124	143	166	187	211	236	262	291
42	74	91	109	128	148	172	193	218	244	270	300
43	.....	.....	113	133	154	179	201	225	252	280	310
44	.....	.....	117	137	159	184	207	233	261	289	320
45	.....	.....	.....	.....	165	191	215	240	269	298	330
46	.....	.....	.....	.....	170	197	222	247	277	307	340
47	.....	.....	.....	.....	.....	.....	229	254	285	316	350
48	.....	.....	.....	.....	.....	.....	236	261	293	325	361
49	.....	.....	.....	.....	.....	.....	.....	.....	301	334	371
50	.....	.....	.....	.....	.....	.....	.....	.....	310	344	382

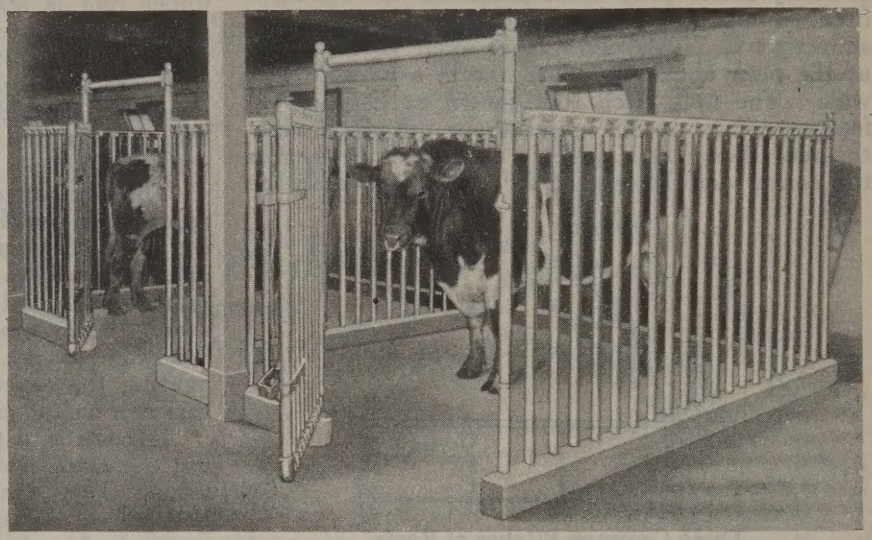
Add 5 feet to height indicated, to allow for settling of silage. **For further information see page 75.**

A Louden Equipped Government Barn

The Haskell Institute Dairy Barn at Lawrence, Kansas is one of many government Indian institute barns that are Louden equipped, and is but one of hundreds of government and state barns that use Louden equipment.

In the Haskell Dairy Barn are used Louden Litter and Feed carriers, Calf, Cow, and Bull pens, together with 81 Louden stalls. The stalls are of the Go-Right type set in three rows of 27 each. All of the stalls in one section are hooked up with one lever and work fine. The whole row can be thrown with a slight push on the lever.

The following letter from Mr. MacArthur, dairyman at Haskell Institute, to Mr. H. P. Harbison, a Kansas City representative of Louden Machinery Company, indicates the degree of satisfaction the equipment is giving:



Louden Bull Pens in Haskell Institute Dairy Barn

DEPARTMENT OF THE INTERIOR
United States Indian Service Haskell Institute

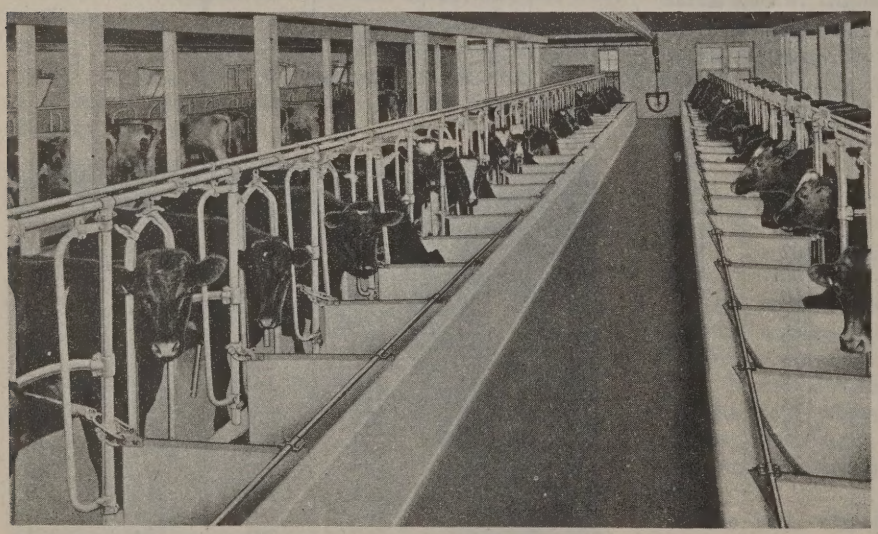
Mr. H. P. Harbison,
Kansas City, Mo.

Lawrence, Kansas, May 6, 1914.

Dear Sir:

I rather think that I promised to write you when the Louden equipment was installed in our dairy barn and let you know my opinion of your equipment after it was put to the test with inexperienced help. Of course you know the Indian boys have had no training and were necessarily inexperienced, which together with a herd of young cows, would be very trying regarding strength and utility. I will confess that I had my fears that our Indian boys would be too reckless and careless and therefore cause considerable amount of breakage with such a complete equipment, for you know that we purchased the latest and most up-to-date that you manufacture, but to my surprise the hard strain of winter use, with 125 head of cattle there is not the least repair needed in stanchions, bull, cow, or calf pens.

You remember we hung up some ninety-six feet of sure stop to pull with one lever, which you were afraid would work too hard. It works easily and the boys handle it with one hand.



Louden Stalls, Stanchions and Manger Divisions in the Haskell Institute Dairy Barn

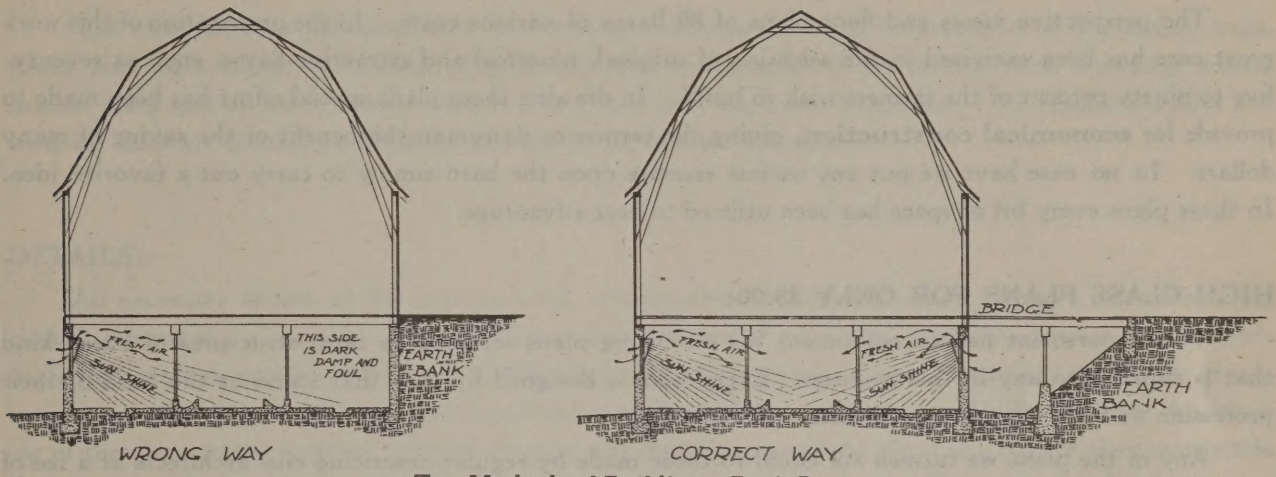
The high curb with cut-out for stanchions is great from a standpoint of economy, as the cows can't possibly waste their feed by throwing it under their feet.

You remember we arranged to water the stock in the cement mangers during stormy weather, which arrangement is very satisfactory, as we lift the partitions between cows, sweep out mangers thoroughly, and turn in water until all finish drinking.

The dairy barn at Haskell is now a place of interest to visitors who constantly pass through the institution and remarks of praise regarding the Louden equipment are constantly overheard.

Continued bottom next page.

CUT SHOWING CORRECT CONSTRUCTION FOR BASEMENT BARNS



Two Methods of Building a Bank Barn

Modern Sanitary Bank Barns

The ordinary, old-fashioned stable under a bank barn was damp and warm when filled with animals in the winter time and it was damp and cool in summer. The warmth and coolness were agreeable, but disease lurked in both conditions of the stable atmosphere.

Since investigators have been looking into the germ troubles that domestic animals suffer from, attention has been directed to the objectionable features of these old-fashioned stable dungeons.

Anarchist germs prefer darkness to light. They thrive when the atmosphere is moisture laden. If the moisture comes from the breath of animals, they thrive all the better; it seems to act as a culture medium, to propagate the most undesirable of all cattle disease germs.

Sunshine and fresh air are the two principal preventatives. In this illustration the architect shows how to build a bank barn on sanitary principles—the bank is kept back away from the barn wall, and the upper floor is reached by a bridge.

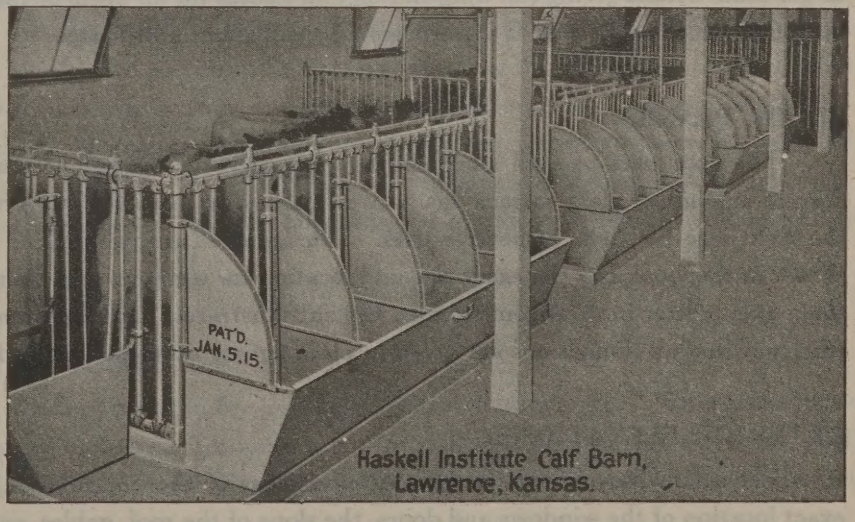
Bank barns are not necessarily objectionable. Usually, they are built on an elevation where drainage may be maintained in spite of the usual barnyard proclivities to get muddy and stay muddy. Besides offering better sanitary conditions, this plan provides the best possible means for establishing warm winter corrals having gates and passage-ways leading all the way around the stable section of the barn.

In grading the side of the bank, the earth removed to make this passage-way may be dumped in scraper loads to fill the pot holes and to grade up the corrals, lanes, etc.

I will arrange to get you some fine views soon. We have to finish our spring cleaning and the cattle are not entirely shed off yet, but just a little later we will be ready to give you some views you will appreciate.

Very respectfully,
Donald MacArthur, Dairyman.

Uncle Sam has been testing out Louden equipment for many years, and the fact that it is specified for most government buildings is one of the strongest recommendations that can be given to the equipment. Write for names of Louden equipped barns in your vicinity.



Louden Calf Pens in Haskell Institute Dairy Barn

THIS BOOK ILLUSTRATES:—

The perspective views and floor plans of **80** barns of various costs. In the preparation of this work great care has been exercised in the selection of original, practical and attractive barns, such as seventy-five to ninety percent of the farmers wish to build. In drawing these plans special effort has been made to provide for **economical construction,** giving the farmer or dairyman the benefit of the saving of many dollars. In no case have we put any useless expense upon the barn simply to carry out a favorite idea. In these plans every bit of space has been utilized to best advantage.

HIGH CLASS PLANS FOR ONLY $5.00:—

This department has an equipment for producing plans for modern farm structures of every kind that is superior to any in this country. Every plan is designed by men that stand at the head of their profession as farm structure architects and engineers.

Any of the plans we furnish are equal to those made by regular practicing city architects at a fee of 5% of the cost of the building and are in most cases superior because **we specialize** in farm buildings while the general architect only designs a few barns each year.

WHAT WE FURNISH YOU:—

The first question you will ask is "What do we get in these complete working plans and specifications? Are they cheap printed plans made by the thousand like newspapers without details?" The country is now flooded with so-called "Free Plans" that are expensive to build by and we do not blame you for wishing to know what you will get for your money.

BLUE PRINTED WORKING PLANS:—

The plans we send out are the regular blue printed plans, details and specifications, carefully reproduced by the electric blue print process from the architect's drawings and type-written specifications. All accurately drawn to a convenient scale, showing the arrangement of all stalls, pens, bins, rooms, etc. Elevation drawings of the four exterior sides, cross sections showing the construction and framing, larger scale details giving full information and figures for all parts of the construction. Drawings are made on tough white paper that is waterproof and will stand hard usage.

FLOOR PLANS:—

The floor plan of each story shows accurately the location and size of each window and door. The correct amount of glass surface has been calculated to keep the stock healthy, and the doors are planned of the right size for their respective uses. The general arrangement is the same as that given in the cut shown in this book but the exact size and location for windows and doors are changed in some plans to make them even better in arrangement then the cut illustrates. All stalls and passageways are figured for best efficiency and all dimensions are given in plain figures that you can understand.

EXTERIOR ELEVATIONS:—

Elevation drawings of the four exterior sides of the building are accurately worked out showing the exact location of the windows and doors, the slope of the roof, gables, cupolas, ventilators, etc.

CROSS SECTIONS:—

The cross sections furnished with the working drawings show the construction of foundation walls, floors, side walls, height of ceilings, pitch of roof, size and lengths of the rafters, joist, studding, beams, braces, posts and all other lumber used and just how they are framed together. All ventilation flues and fresh air flues are carefully calculated and shown on sections and plans.

DETAILS:—

All necessary details of the interior work, construction of windows, doors, cornices, vent flues, hay chutes, cement floors, cement gutters and mangers, framing of structural members, trusses and all other parts that require detail drawings are clearly drawn to a larger scale, giving dimensions and kinds of material used. We guarantee to furnish details for everything that is necessary to clearly illustrate the meaning of the plans to the builder. Should there be any doubt in your mind about any part of the construction that is not made clear by the drawings you receive, write us fully and we will furnish details of the parts in question without any charge.

SPECIFICATIONS:—

Complete specifications are furnished with each set of plans, blue printed from the architect's original typewritten copy so no clerical errors can be made in reproducing them and so they can not be changed by a dishonest workman on the job, without discovery. They consist of 18 to 25 pages of closely typewritten matter, letter size, giving full instructions for carrying out the work.

All necessary instructions are given in simple and most explicit manner so there can be no misunderstanding.

BILL OF MATERIAL, NOT INCLUDED WITH PLANS:—

We do not furnish a bill of material with the plans. We state this here particularly, as some people have an idea that a bill of material should accompany each set of plans and specifications. In the first place, our plans are gotten out in a comprehensive manner so any carpenter can take off the bill of material without any difficulty. There are hardly two sections of the country where the same kind of material is used and a bill which we might furnish (unless it is made particularly for your location) would not be applicable. Again, many barns are built by lump sum contract and the contractor prefers to figure his own bill because he is held responsible for its correctness. We have therefore made the price of the plans and specifications separate from the bill of material so you will not be compelled to pay for a list of material unless you have particular use for it.

BILL OF MATERIAL CAN BE FURNISHED:—

We are in a position to make a bill of material for any design shown in this book. These bills of materials however **are not guaranteed by us** because we could not be accountable for any shortage in material that may be wasted by careless workmen. Write us for prices of bills of material and we will be pleased to quote you.

The Estimated Cost

There is a great difference in the cost of building materials at various parts of the United States and the markets are constantly changing. For these reasons it is impossible for us to give accurate estimates at the time this book goes to press on the cost of the barns illustrated at your particular location and on the particular date that you are ready to build.

One man writes us that the lumber for his barn is going to cost him $35.00 per thousand feet and we received a letter from another man the same week stating that he can buy his lumber from a neighborhood saw mill for $9.00 per thousand feet. The man who paid $35.00 for his lumber must haul it a distance of 8 miles at his expense and the other has only a one-mile haul to his building site. We mention this to illustrate that a certain barn can be built in one locality for $900.00 which would cost $3,500.00 to build in another location at the same date.

To make the estimates given in this book of real value to you we give a schedule of prices for material and labor used in making up the estimates as follows:

JOIST, SCANTLING AND TIMBER PER 1000 BOARD FEET

Size	12–16	10–18–20	22	24	26	28
2x4, 2x6, 2x8	$26.00	$28.00	$30.00	$32.00	$34.00	$35.00
2x10	27.00	29.00	31.00	33.00	35.00	36.00
2x12	28.00	30.00	32.00	34.00	36.00	38.00
3x10, 3x12	32.00	34.00	36.00	38.00	40.00	42.00
4x4 to 8x8	35.00	36.00	36.50	38.50	40.00	42.00

Common Boards per M., No. 1, 4-10″ ..... $35.00 — 12″ $37.50
Common Boards per M., No. 2, 6″ 22.50
Ship lap, D. & M., Drop Siding, 6-8″, per M., No. 1 ..... 35.00 — No. 2 ..... 25.00
O. G. Barn Battens 2¼″, $1.25 per hundred lin. ft.

Shingles R. Cedar Clear, 5 to 2 ..... $4.00 per M.
Shingles R. Cedar Clear, 6 to 2 ..... 3.50 per M.

Finishing Lumber ..... $45.00 per M.

Portland Cement per bbl. $2.25 — Washed Sand per cu. yard $1.50 — Washed Gravel per cu. yd. $2.00

Composition roofing, $3.00 per square, laid.
Common laborers, per hour, 25c. Cement workers, per hour, 50c to 60c.
Carpenter work on framing, $10.00 per 1000 ft. of lumber.
Carpenter work on flooring and siding, $15.00 per 1000 ft. of lumber.
Carpenter work on shingling, $2.00 per M.

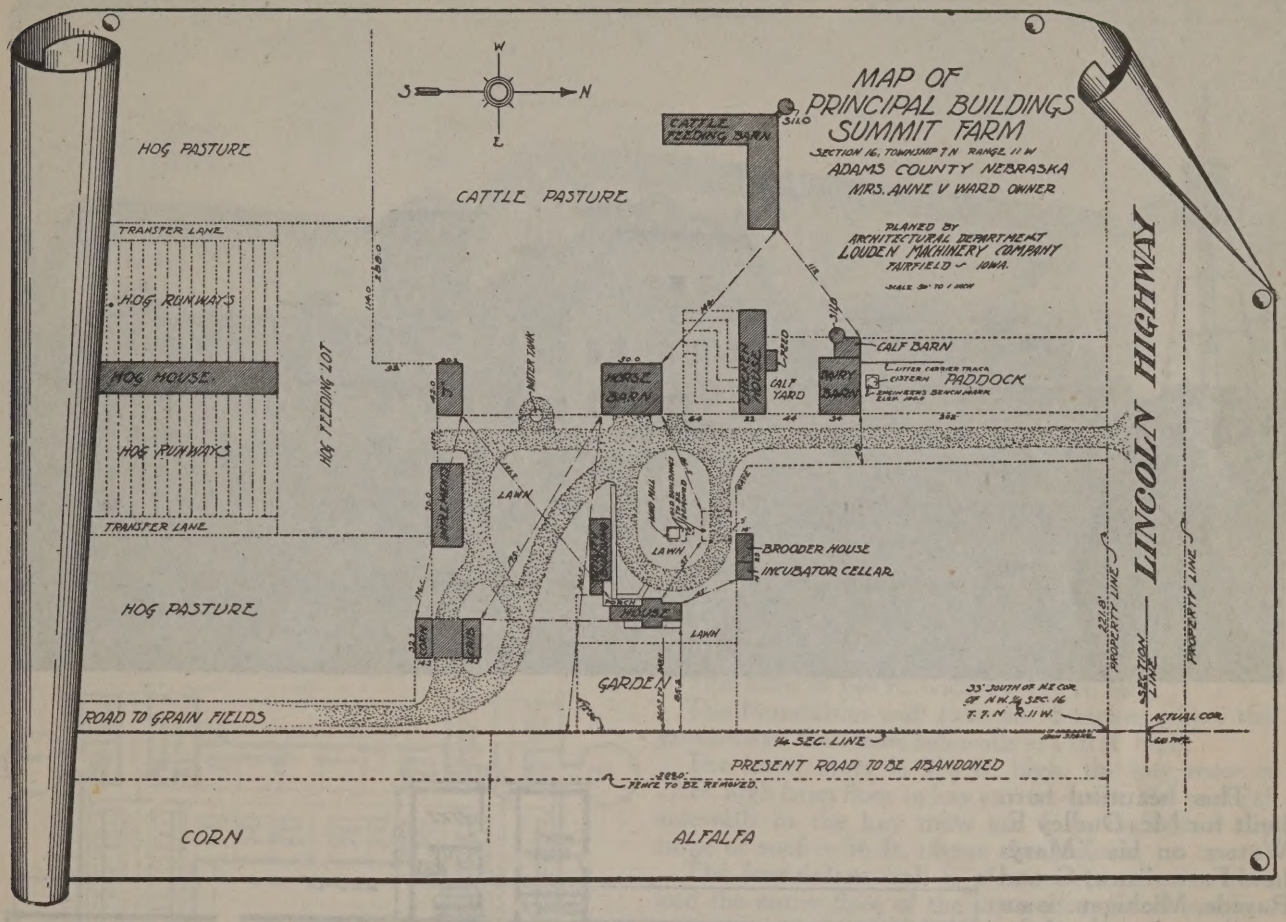
Plastering, including lathing, 4c per sq. ft.
Painting: Material ..... $1.40 per gallon
Labor ..... 1.60 per gallon

$3.00 per gallon—$1.00 per sq. 2 coats

By comparing these prices with your local current prices, it will not be difficult to arrive at an approximate idea of what the barn would cost at your local market prices.

For example: If the book gives the cost of the barn you like as $2,000.00 and by comparing prices you find that your local market quotations are 20% higher than those in the above list, the barn would cost 20% more to build than the book estimate, making the cost $2,400.00.

The estimates given for the cost of the designs shown are for the complete cost including all labor and materials except the stall and pen equipment, carrier systems, hay tools, and silos. Otherwise all is included.



Designing the Farmstead

The above illustration is a reproduction of a farmstead map as designed by our Architectural Department. This map is not published as an ideal arrangement for farm buildings but is to illustrate what can be done in making the best out of a farm that was quite extensively developed before any definite plans were formulated for future improvements.

Every farm owner should have definite plans developed in advance for all future improvements and should have some idea of the cost of each improvement long before he is ready to make it so that he will be fully prepared to make improvements intelligently as the profits of the farm will permit.

The increased value of the property by having the buildings well planned and their surroundings beautified with material which can in most cases be had for the gathering, is at once apparent.

A beautiful farmstead need in no way conflict with the economical operation of the farm, but on the other hand, the convenient buildings would very much reduce the labor problems.

The buildings should be placed in their relation to each other and also with regards to a fine outlook and of a pleasing effect in outline. The location of trees and plants should be studied in connection with the buildings so the appearance will be that of a place where it would be a pleasure to live and encouraging for the young folks to stay on the farm to later complete the execution of the plans previously made by their parents.

Good air, good water, good drainage, sunshine, shelter from cold winter winds, away from the dust of the highway and the odors of the stock are some of the important requirements of the farm house.

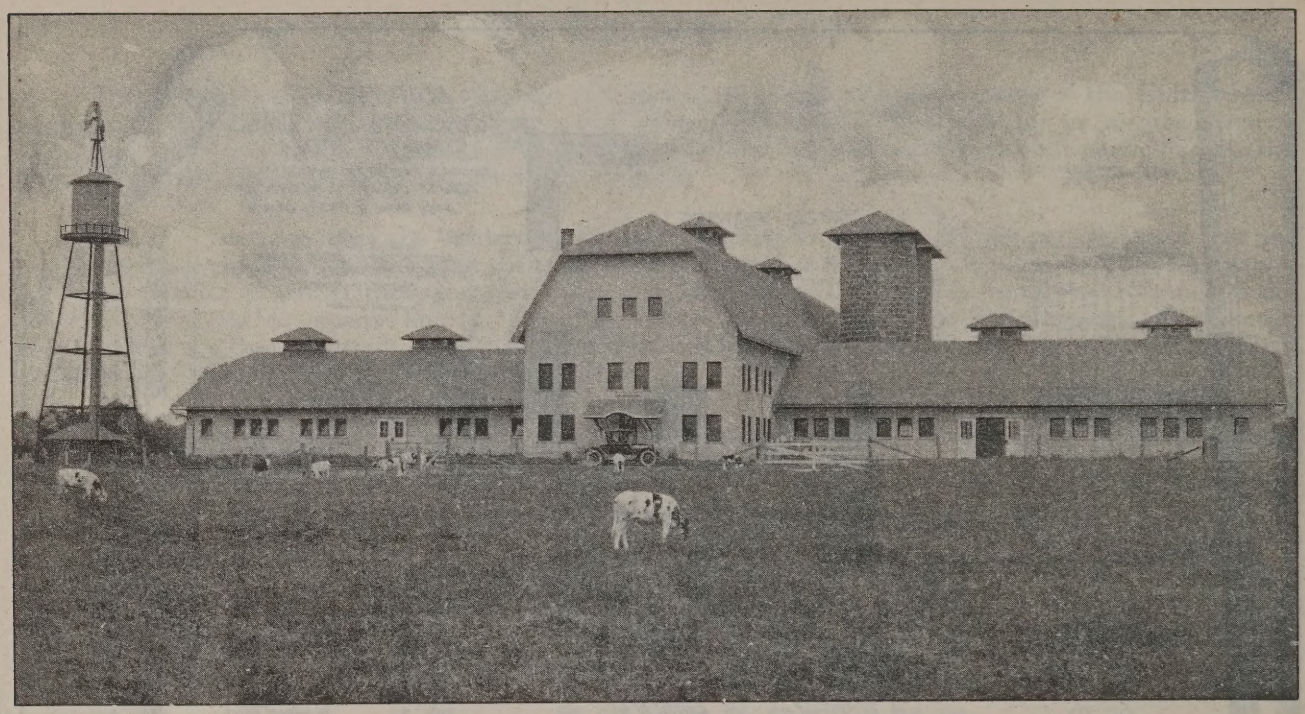
The arrangement of a farmstead is something that can not be standardized. Each farm has its characteristics and fixed points that must be carefully taken into consideration and methods of operating the farm must also be well analyzed before the type or location of buildings is selected.

There are so many points that must be taken into careful consideration in the proper location and grouping of permanent improvements on the farm that the cost of the service of our specialists will be money well spent on the average farm and for a small farm an opinion as to the location of your buildings may be of great help to you. Where no special trip to your farm or other expense is involved we make no charge for assistance along this line.

Some of the points that should be considered are climatic conditions, existing improvements, convenience to fields and highway, direction of prevailing winds and sunshine, kind of farming to be practiced and a general pleasing effect.

The farmstead specialists in our department of Agricultural-Architecture are perfectly equipped and capable of furnishing you expert advisory service and practical plans for the general arrangement of your farmstead. Having made this work a life study and having traveled in all parts of the United States makes them conversant with climatic and soil conditions.

Correspond with us before you are ready to make your farm improvements.

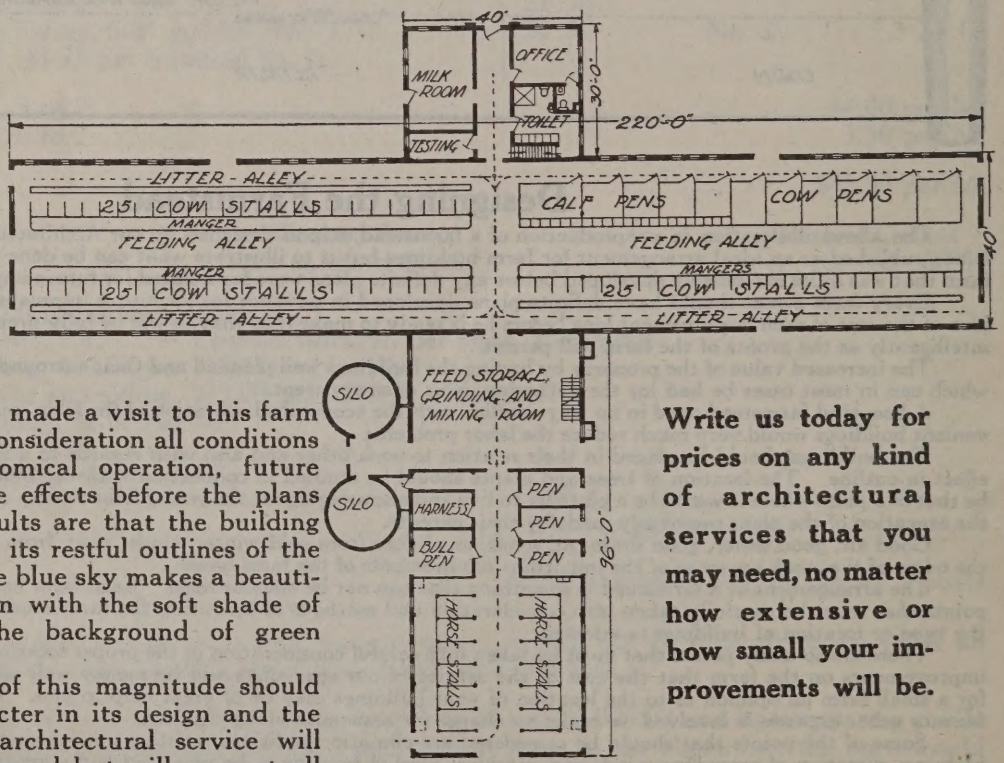


This beautiful barn built for Mr. Dudley E. Waters on his "Maryland Farms" near Grand Rapids, Michigan, is an excellent example of the work of our Architectural Department.

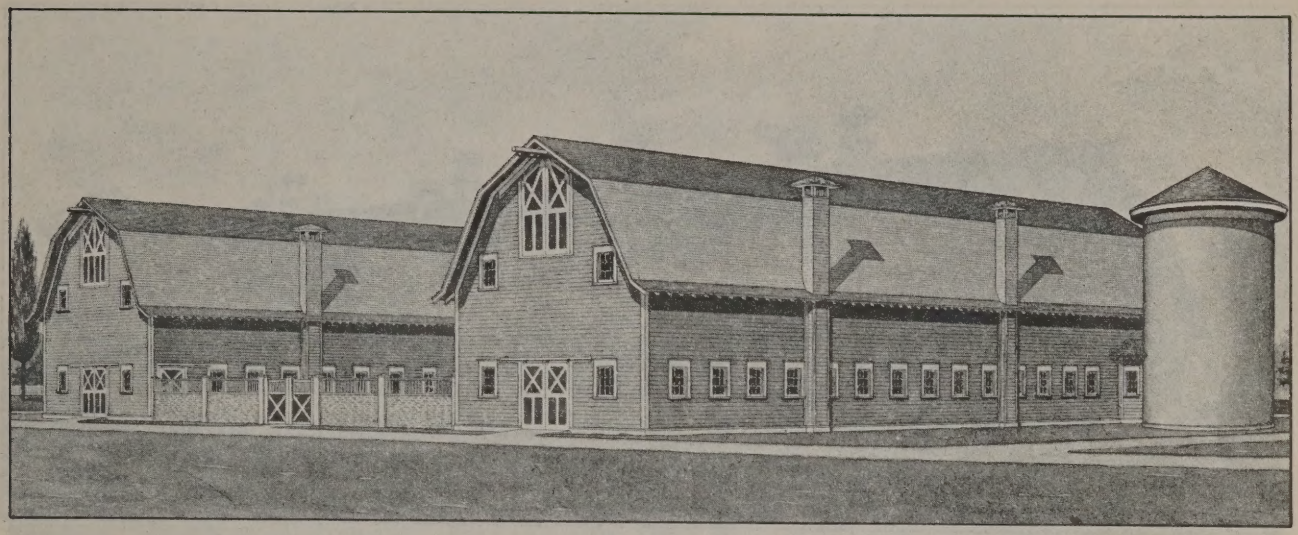
Complete plans and specifications were furnished for the building and they were carefully followed with gratifying results.

One of our Architects made a visit to this farm and carefully took into consideration all conditions pertaining to the economical operation, future expansion and landscape effects before the plans were drawn and the results are that the building is not only practical but its restful outlines of the sea green roof against the blue sky makes a beautiful effect in combination with the soft shade of stucco walls against the background of green alfalfa fields.

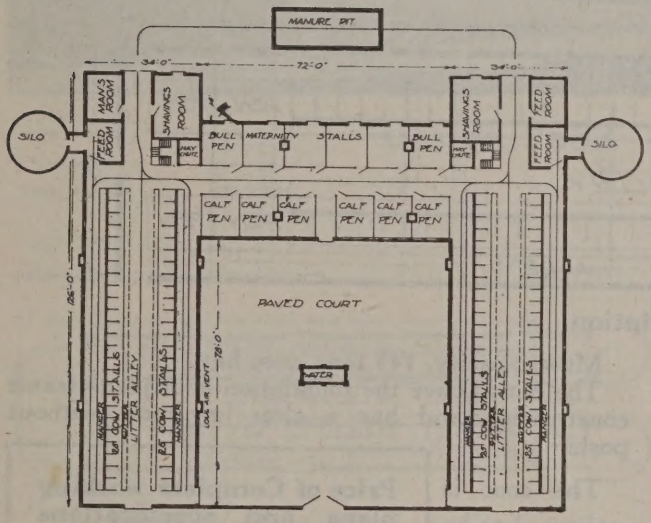
Each farm building of this magnitude should display individual character in its design and the nominal cost of good architectural service will not only supply this demand but will prevent all possibilities of making serious mistakes in its construction and efficient arrangement.



Write us today for prices on any kind of architectural services that you may need, no matter how extensive or how small your improvements will be.



Design 1840—For Dairy Barn



Description

This barn is 126 ft. wide by 140 ft. long.

The foundation wall extends 18 inches above the ground and the frame sidewalls are 16 ft. high.

The lower story is 9½ ft. high, the hay mow is 22 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 6 ft. high, and the ridge of roof is 36 ft. above the ground.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

Capacity of mow, 315 tons loose hay.

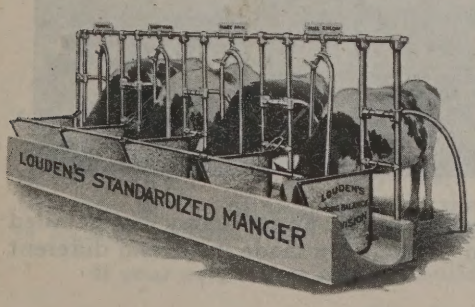
The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $9800.00.

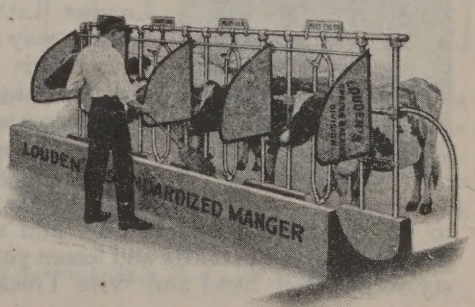
Price of Complete working plans and specifications for Design 1840 $25.00

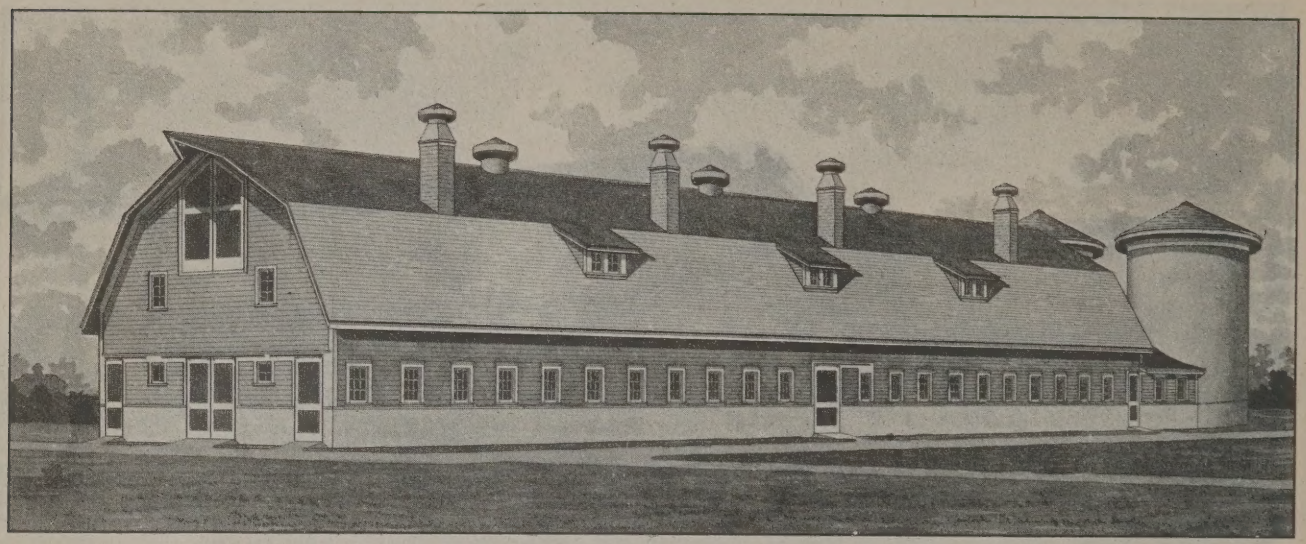
Louden Manger and Manger Divisions

How comfortable the cows look, each eating her apportioned feed without interference from her neighbor, or without straining herself to get some of her neighbor's feed. The shape of the manger makes the feed roll down close to the cow so she will not have to strain to get it as she would if a flat-bottomed manger was used.

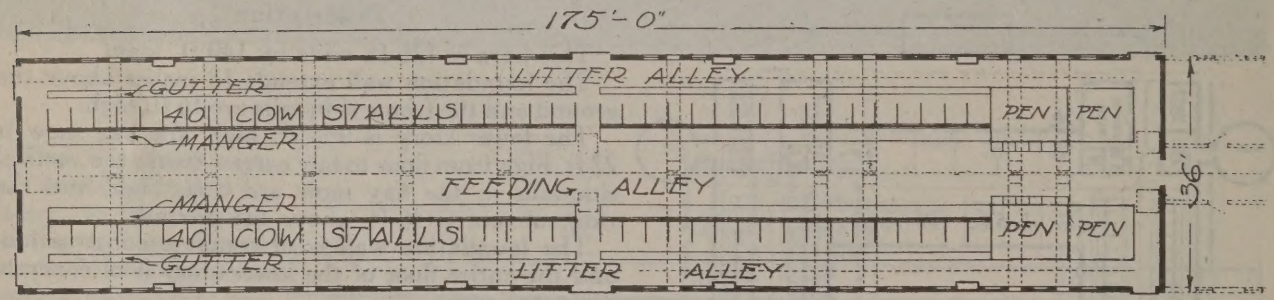


Louden Steel Mangers, also Louden Cement Mangers and Manger Divisions have been adopted by dairy authorities the world over as being the most lasting, convenient and sanitary, and the easiest constructed or installed. Send for special catalogs.





Design 2603 — For 80 Cows



Description

This barn is 36 ft. wide by 175 ft. long.

The foundation wall extends 4 ft. above the ground and the frame sidewalls are 10 ft. high.

The lower story is 9½ ft. high, the hay mow is 19 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 3 ft. high, and the ridge of roof is 32 ft. above the ground.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

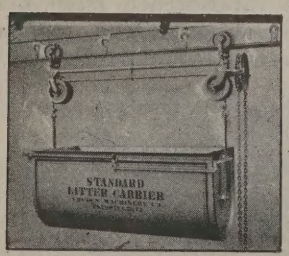
Mow capacity, 145 tons loose hay.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

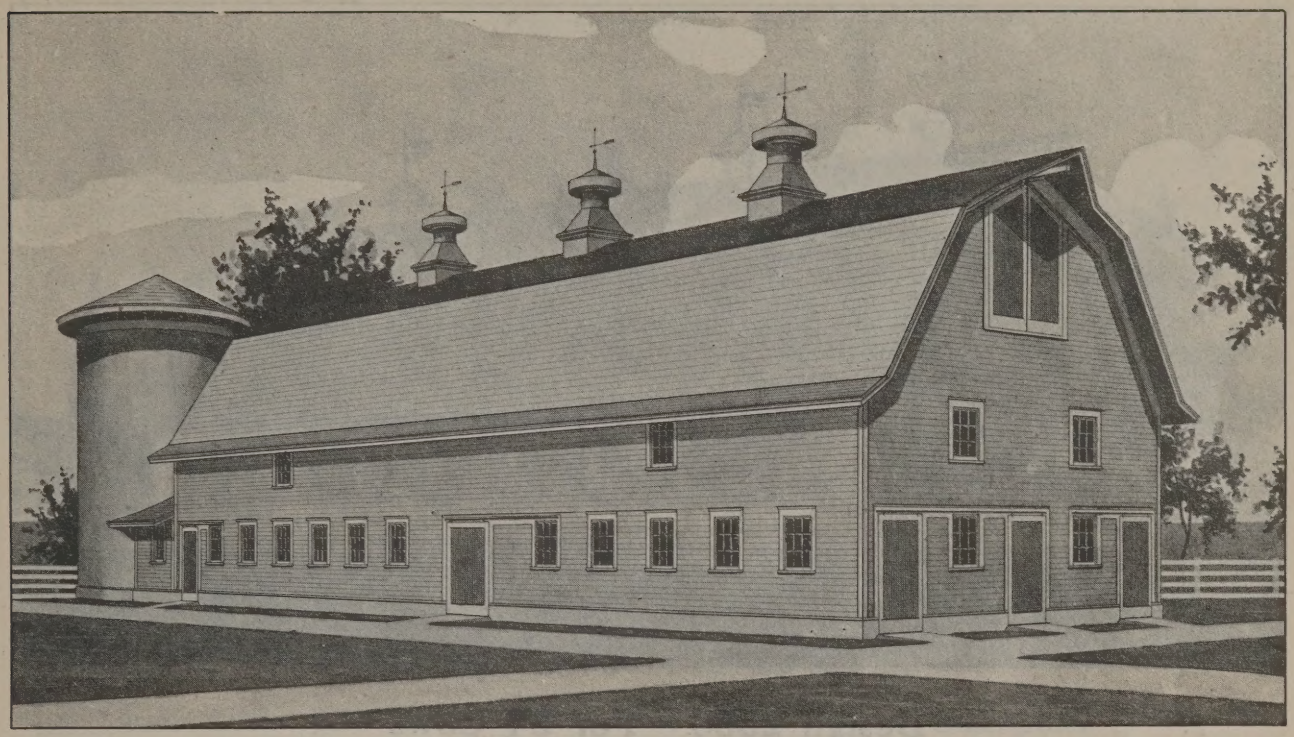
The cost is estimated to be $6000.00.

Price of Complete working plans and specifications for Design 2603 $15.00

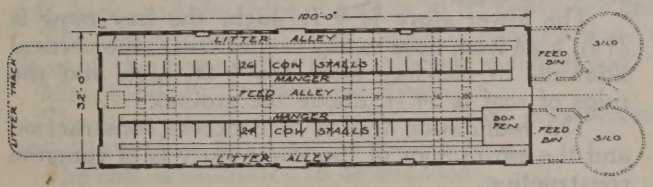
Louden Litter Carriers



The Louden Litter Carrier is a great time and labor saver. With a Louden Litter Carrier, barn cleaning is made easy and pleasant work. Every farm needs this equipment. Manure may be taken directly from the stalls to the spreader or manure pit with but one handling and in half the time necessary by the old-fashioned method. Loaded cars may be raised and lowered to any height by a small boy, and run out and emptied anywhere desired. Write today for detailed information and catalogs and lessen your winter barn work. Louden Carriers are made in several different styles both for Steel and Wire Track.



Design 2563—For 50 Cows



Description

This barn is 32 ft. wide by 100 ft. long.

The foundation wall extends 18 inches above the ground, and the frame sidewalls are 14 ft. high.

The lower story is 9 ft. high, the hay mow is 20 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 6 ft. high, and the ridge of roof is 33 ft. above the ground.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

Mow capacity, 95 tons loose hay.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

This cost is estimated to be $3100.00

When to Cut the Ensilage

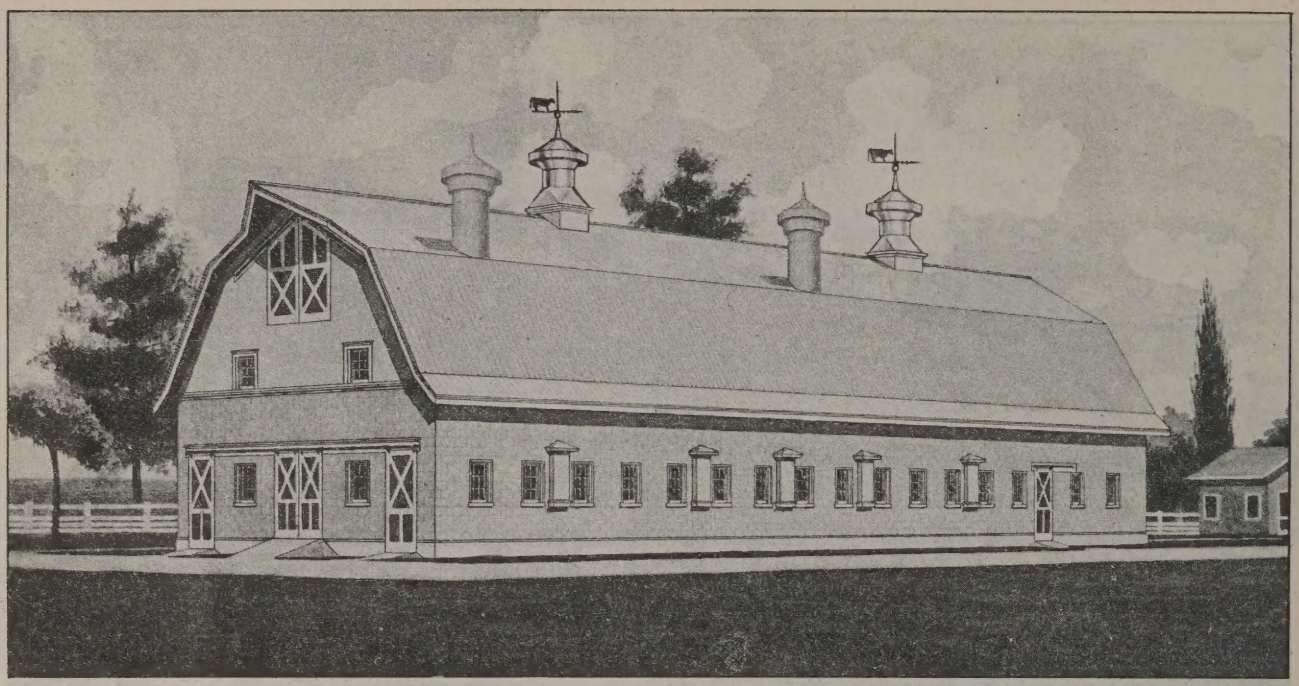
Water and Dry Matter in Corn at Different Periods

Date of cutting	Stage of growth	Corn per acre	Water per acre	Dry matter per acre
July	30—Fully tasseled	9.0	8.2	.8
August	9—Fully silked	12.9	11.3	1.5
August	21—Kernels watery to full milk	16.3	14.0	2.3
September	7—Kernels glazing	16.1	12.5	3.6
September	23—Ripe	14.2	10.2	4.0

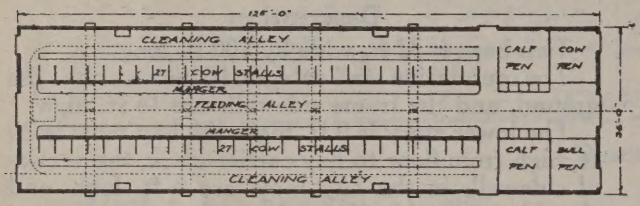
Price of Complete working plans and specifications for Design 2563 ..... $5.00

In the last column is shown the dry matter per acre in corn at different stages. When the corn is fully tasseled, it contains but eight-tenths of a ton of dry matter per acre, or only one-fifth what it contains when fully ripe. When in the milk it contains nearly three times as much dry matter as when fully tasseled. Only seventeen days were occupied in passing from the milk to the glazing stage, yet in this time there was an increase in the dry matter of 1.3 tons per acre. This shows the great advantage of letting the corn stand until the kernels are glazed.

If your neighbor is going to build tell him about this book—and do both him and us a good turn.



Design 2550 — For 54 Cows



The key to sanitary dairy barn construction lies in the combining of the steel stall and stanchion construction together with impervious cement floors, plenty of light and proper ventilation.

This barn has been especially designed for concrete block or hollow tile wall construction and a timber roof covered with corrugated iron roofing.

It is very fire resisting from the exterior, durable and the hollow masonry walls give it good protection against extreme cold and hot weather.

Description

This barn is 36 ft. wide by 125 ft. long.

The concrete foundation wall extends 18 inches above the ground and the cement block sidewalls are 14 ft. high.

The lower story is 9 ft. high, the hay mow is 21 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 4 ft. high and the ridge of roof is 34 ft. above the ground.

The foundation wall is of concrete construction and the entire floor of the lower story is of concrete construction.

Mow capacity, 142 tons loose hay.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $4,000.00.

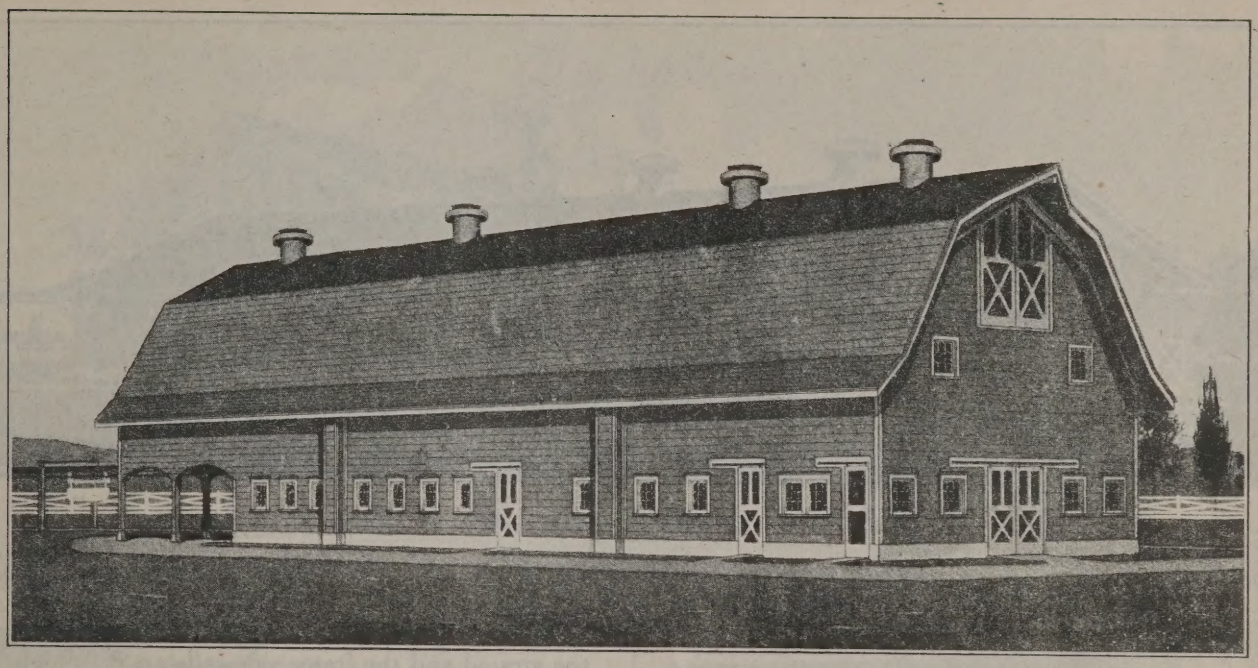
Price of Complete working plans and specifications for Design 2550 ..... $5.00

Dear Sirs:

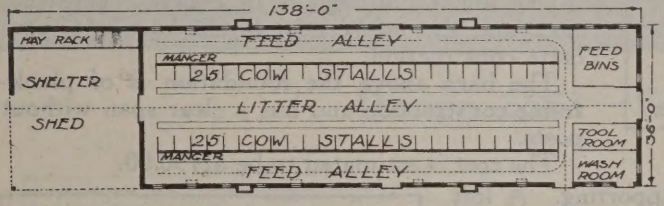
After using your barn equipments for seven years I find them to be O. K. in every respect, and doing me good service now. I do not know how I could get along without it. My first purchase of your goods was in 1907.

Yours truly,

Wm. Griffin, East Orwell, O.



Design 1670—For 50 Cows



Description

This barn is 36 ft. wide by 138 ft. long.

The foundation wall extends 18 inches above the ground, and the frame sidewalls are 14 ft. high.

The lower story is 9 ft. high, the hay mow is 23 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 6 ft. high, and the ridge of roof is 36 ft. above the ground.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

Mow capacity, 165 tons loose hay.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $4224.00.

Price of Complete working plans and specifications for Design 1670 ..... $6.00

The shelter shed at the end of this barn has a southeast exposure and for northern climates is a feature that should not be overlooked. This gives the cattle a place to exercise under cover in bad weather.

The vent flues projecting on the outside of the walls in place of inside gives the feed alleys a smooth wall without projections.

Louden Machinery Company,

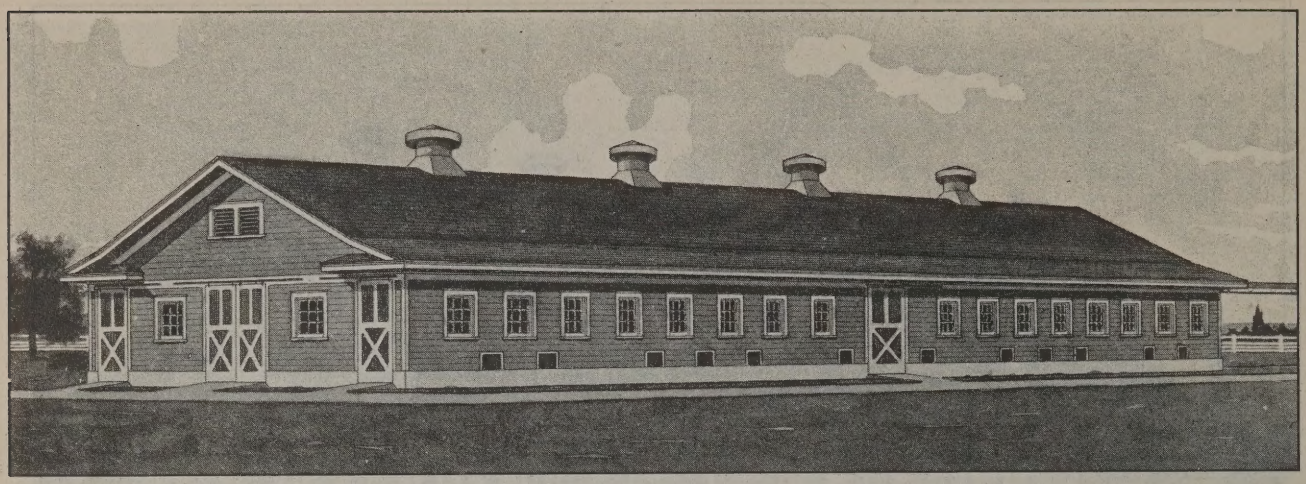
Dear Sirs:

Your outfit is giving perfect satisfaction and will last, I believe, as long as the cement floor in which it is set. I value this outfit highly.

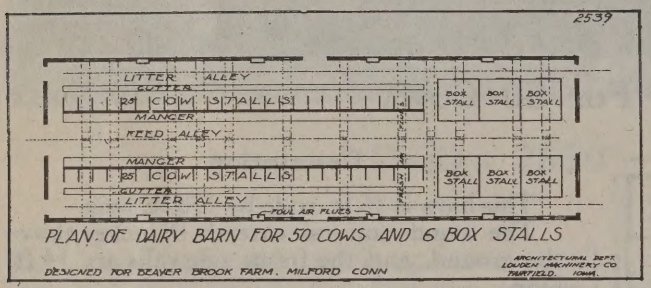
At the present time no one will question the fact that the more comfort given the cow the more milk she will give, but I think there are few that realize that it effects the test even to perhaps a greater degree.

Stable your cows in a cold, unventilated, poorly lighted barn with the rigid stanchions for a winter, and the next winter give them swinging stanchions, the proper amount of light, air, and protection from the cold, and it will be found there will be a big difference in the test.

Yours very truly,
Ora P. Taylor,
Elkhorn, Wis.



Design 2539—For 50 Cows and 6 Box Stalls



Description

This barn is 40 ft. wide by 130 ft. long.

The foundation wall extends 18 inches above the ground and the frame sidewalls are 8 ft. high.

The story is 9½ ft. high, and the ridge of roof is 20 ft. above the ground.

The foundation wall is of concrete construction, and the entire floor of the barn is of concrete construction.

The barn above the foundation is of plank-frame construction and has a clear span without posts.

The cost is estimated to be $2750.00.

In this particular stable the ceiling is self-supporting. A loft over a stable like this is not used for any purpose except as an air space, and the air is changed by having a window in each gable. The silos are placed between the stable and storage barn, with room for a feed carrier to pass through; this carrier track extends the whole length of the cow stable and runs far enough into the storage barn to load the litter carrier.

Price of Complete working plans and specifications for Design 2539 ..... $5.00

In a modern stable like this, it is possible to work in a great many conveniences that the men will appreciate when doing the work. Arrangements to save steps and hand labor a good many times a day will count up during the year.

Average Periods of Gestation

The period of gestation in animals varies considerably, but the following is an average period based on a long series of observations:

Ass	12 months	Pig	3½ months
Mare	11 months	Bitch	9 weeks
Cow	9 months	Cat	8 weeks
Sheep	5 months	Rabbit	30 days
Goat	5 months	Guinea pig	65 days

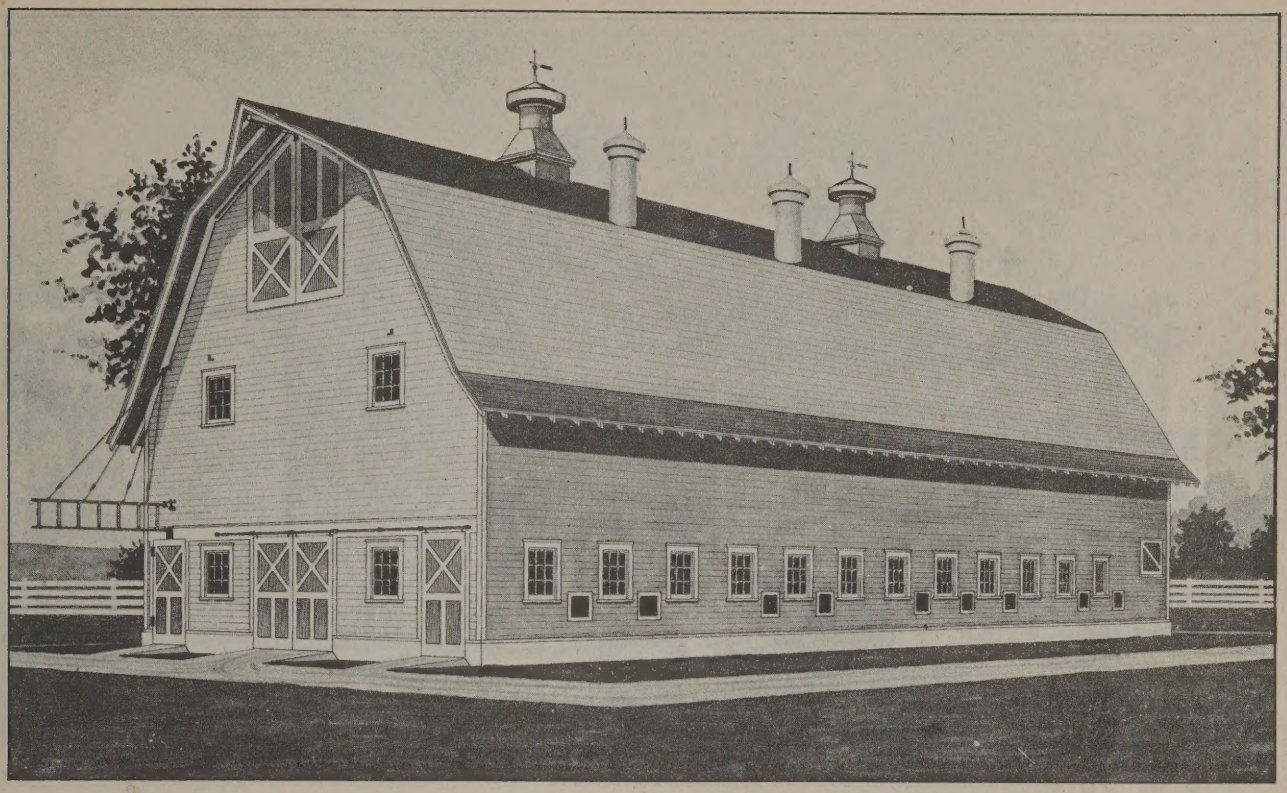
Louden Machinery Company, Mattoon, Ill., May 5, 1913.

Gentlemen:

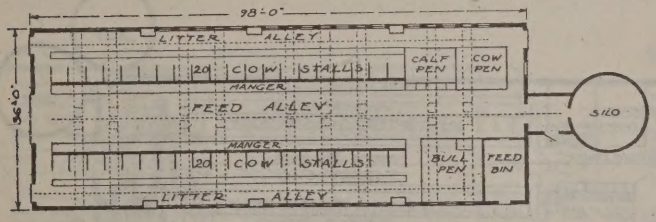
Your stanchions are the greatest thing to tie cows with that ever was manufactured. The cows can lie down comfortably when tied with them and stand more quietly while being milked.

As to strength, I have tied cows that weighed up to 1500 lbs. that had never been tied, and they certainly gave them a thorough test. Have used them 2 years and have had no expense whatever.

Yours very truly,
H. F. Hoferkamp.



Design 2561—For 40 Cows



The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

Mow capacity, 120 tons loose hay.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $2880.00.

Description

This barn is 36 ft. wide by 98 ft. long.

The foundation wall extends 18 inches above the ground, and the frame sidewalls are 16 ft. high.

The lower story is 9 ft. high, the hay mow is 24 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 7 ft. high, and the ridge of roof is 37 ft. above the ground.

Price of Complete working plans and specifications for Design 2561 ..... $5.00

A good farm deserves good buildings.

Any farm is good that provides a living for the family.

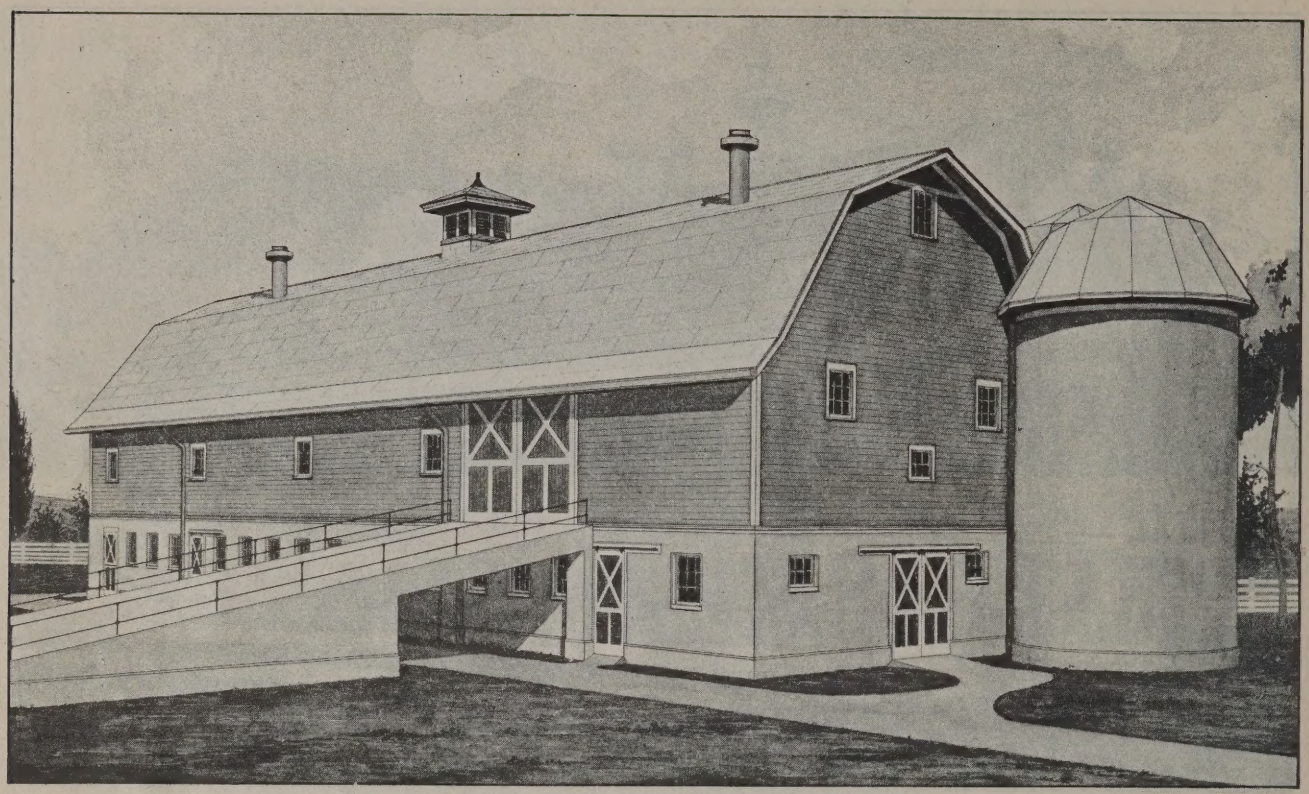
Comfortable buildings help to make a poor farm good and a good farm better.

Even the land that has been ruined and "turned out to the Lord" may be brought back to life by the aid of live stock; but first you must have buildings and fences to make the live stock comfortable.

Each farm is shy a building or two, and most farms need more fencing. Fences for range, health and pasture; barns and stables for storage and winter feeding.

Economy in business often means spending money for necessary improvements.

If animals require all their feed to keep them alive and warm, then the grain is being burned for fuel, while the animals are marking time. Time may not be much of an object to the animal, but it is to the owner.



Design 2915—For 40 Cows

Description

This barn is 36 ft. wide by 123 ft. long.

The basement wall extends 10 ft. above the ground, and the frame sidewalls are 14 ft. high.

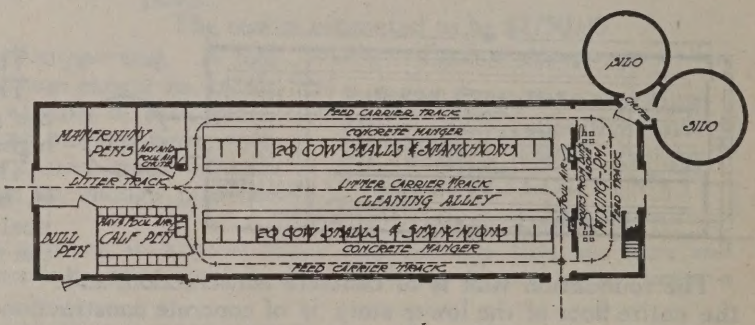
The lower story is 9½ ft. high, the hay mow is 28 ft. high from floor to hay carrier-track. The ridge of roof is 42 ft. above the ground.

The basement wall is of hollow tile construction, and the entire floor of the lower story is of concrete construction. Roof is covered with sheet asbestos roofing.

Mow capacity, 132 tons loose hay.

The barn above the basement is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $8000.00.



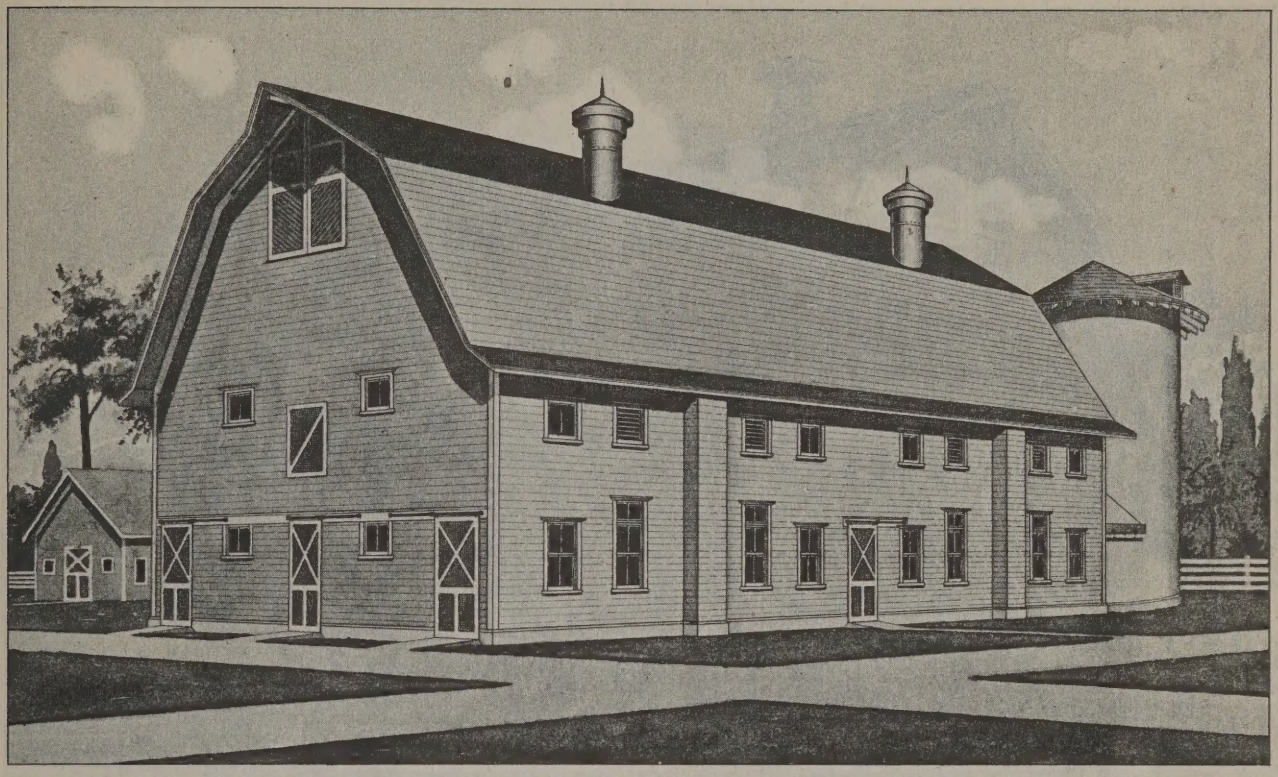
Price of Complete working plans and specifications for Design 2915 ..... $10.00

Sirs:

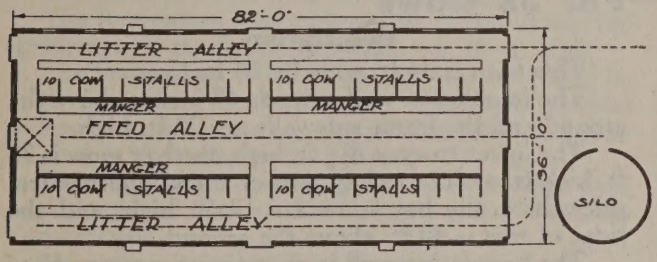
I bought your feed and litter carriers about ten years ago and am using them yet without one cent of expense for repair in any way and it looks to be good for ten years more. The only thing I am sorry for is that I did not get a larger machine as we could just as well use it. We carry the manure about ninety feet after crossing a forty foot barn.

Respectfully,

J. H. White, La Fayette, Ill.



Design 1653—For 40 Cows



Description

This barn is 36 ft. wide by 82 ft. long.

The foundation wall extends 12 inches above the ground, and the frame sidewalls are 16 ft. high.

The lower story is 8½ ft. high, the hay mow is 24 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 7 ft. high, and the ridge of roof is 37 ft. above the ground.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

Mow capacity, 120 tons loose hay.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $2700.00.

Special attention has been given to the proper distribution of windows for light, location of doors for convenience and location of ventilation flues for keeping the barn sweet and sanitary at all times.

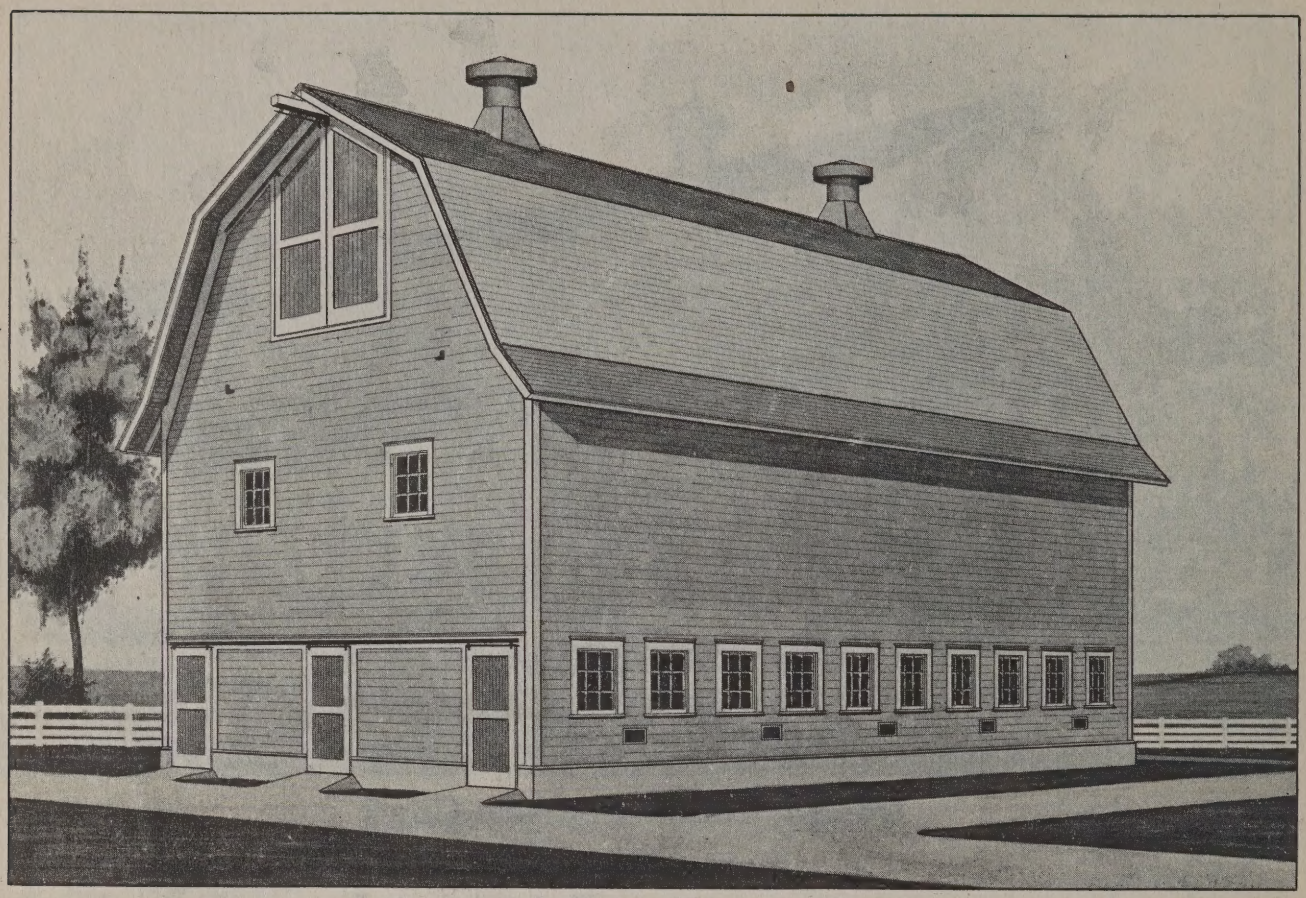
The hay mow has a capacity of about 90 tons and has a hay chute located at one end so hay can be thrown down into the end of feeding alley.

Price of Complete working plans and specifications for Design 1653 ..... $5.00

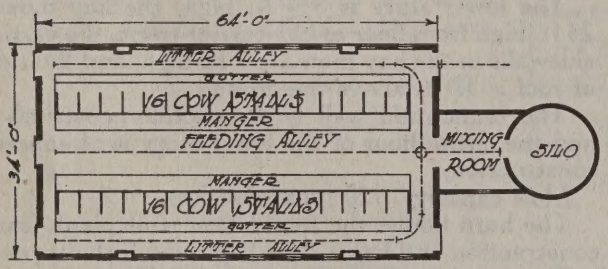
The Louden Machinery Co., Guelph, Ont.

Dear Sirs: I am well satisfied with the Car and Slings; they are among the greatest labour savers on the farm, especially this year, when hay and straw are so short. I can put enough feed into the loft in one day now to last me a month, and no lifting and forking. Wishing your Company a prosperous year, I remain,

Yours truly, Geo. Church, Niverville, Manitoba.



Design 3982—For 32 Cows



Description

This barn is 34 ft. wide by 64 ft. long.

The foundation wall extends 18 inches above the ground and the frame sidewalls are 20 ft. high.

The lower story is 8½ ft. high, the hay mow is 28 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 12 ft. high, and the ridge of roof is 40 ft. above the ground.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

Mow capacity, 95 tons loose hay.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $2500.00.

Price of Complete working plans and specifications for Design 3982 ..... $5.00

The Louden Machinery Co., Fairfield, Iowa.

Gentlemen: We recently installed two of your Garage Door Hanger outfits, and now have need of another one. They give excellent satisfaction. We will try to use them on all our garages in the future.

Please send us one outfit for an eight foot door immediately. Yours truly,

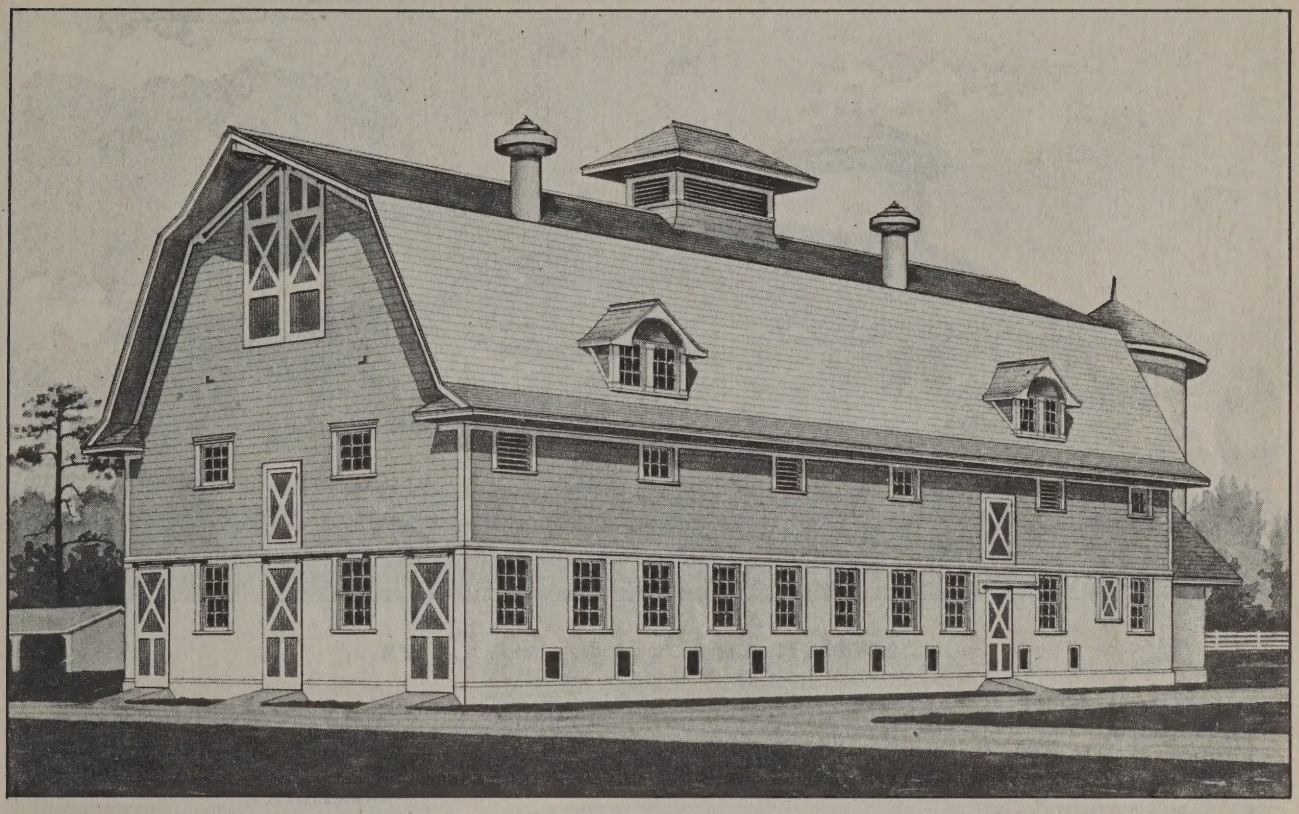
GRAY BROS., Arcola, Ill.

June 21, 1917. C. W. Gray.

Dear Sirs:

I have used Louden tools for the past ten years and must say that they are as good as any other or better. Your barn equipment which I got about seven years ago is still in use. Yours truly,

P. J. Banman, Morton, Ill.



Design 1619—For 30 Cows

Description

This barn is 34 ft. wide by 86 ft. long.

The foundation wall extends 18 inches above the ground, and the frame sidewalls are 18 ft. high.

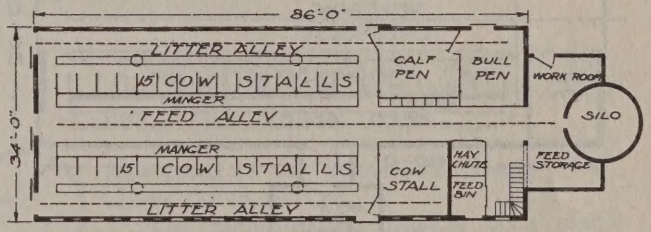
The lower story is 9 ft. high, the hay mow is 25 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 9 ft. high, and the ridge of roof is 37 ft. above the ground.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

Mow capacity, 110 tons loose hay.

The barn above the foundation is of plank-frame construction, and has a clear hay mow without posts.

The cost is estimated to be $2800.00.



Besides stalls for thirty cows, this barn has three large pens, one for seven calves, one for bull, and one for cow or young stock. These pens extend from the center feed alley to the outside walls which makes them a good size. The hay chute can be enclosed with door to make it dust proof.

Price of Complete working plans and specifications for Design 1619 ..... $5.00

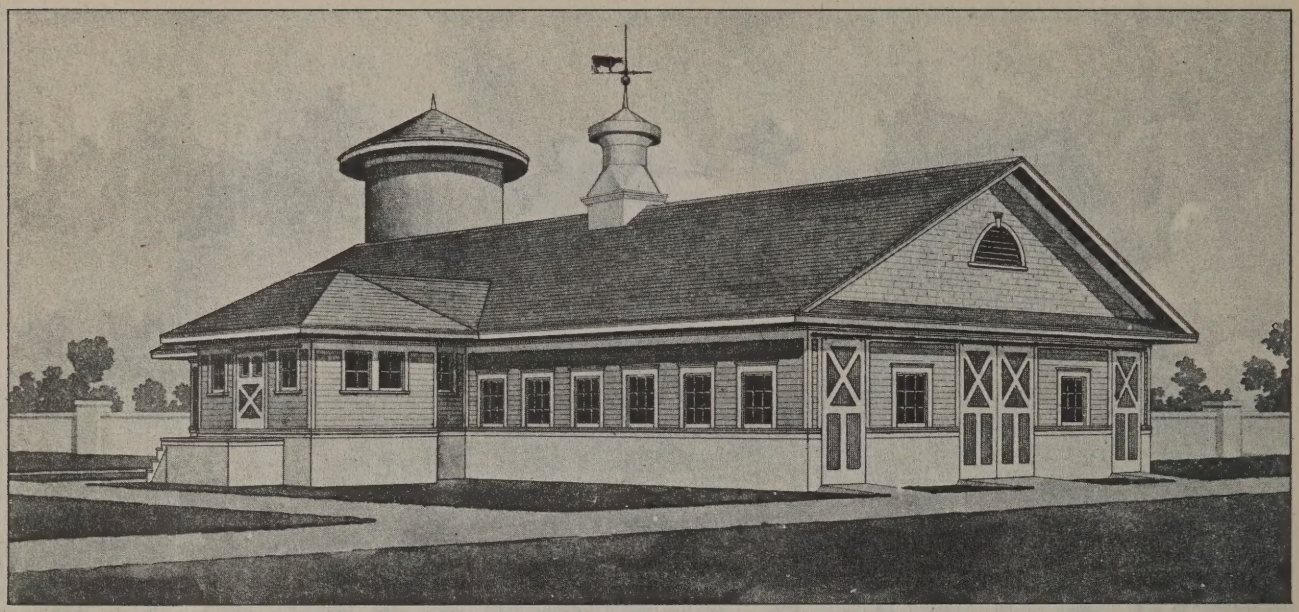
Louden Machinery Company,

Gentlemen:

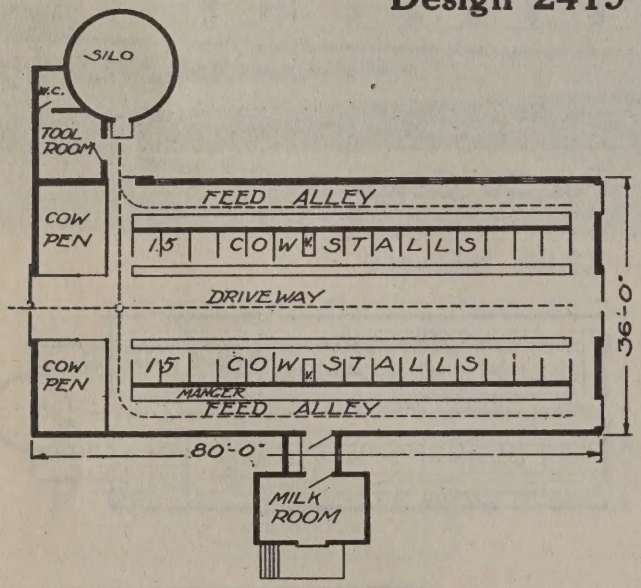
The Louden goods used by the Iowa State College, consisting of litter carriers, hay tools, stalls and stanchions, have proven to be very satisfactory and have proven to be all that you claim for them. We have used more or less of your equipment for many years and find that the cost of repairs has been exceedingly low.

Trusting this may be of interest to you, we are

Very truly yours, Department of Agricultural Engineering,
By J. B. Davidson, Professor of Agricultural Engineering.
Iowa State College, Ames, Iowa.



Design 2419—For 30 Cows



Description

This barn is 36 ft. wide by 80 ft. long.

The foundation wall extends 36 inches above the floor, and the frame sidewalls are 6½ ft. high.

The story is 9 ft. high, and the ridge of roof is 22 ft. above the ground.

The foundation wall is of concrete construction, and the entire floor of the barn is of concrete construction.

The barn above the foundation is of plank-frame construction and has a clear span without posts.

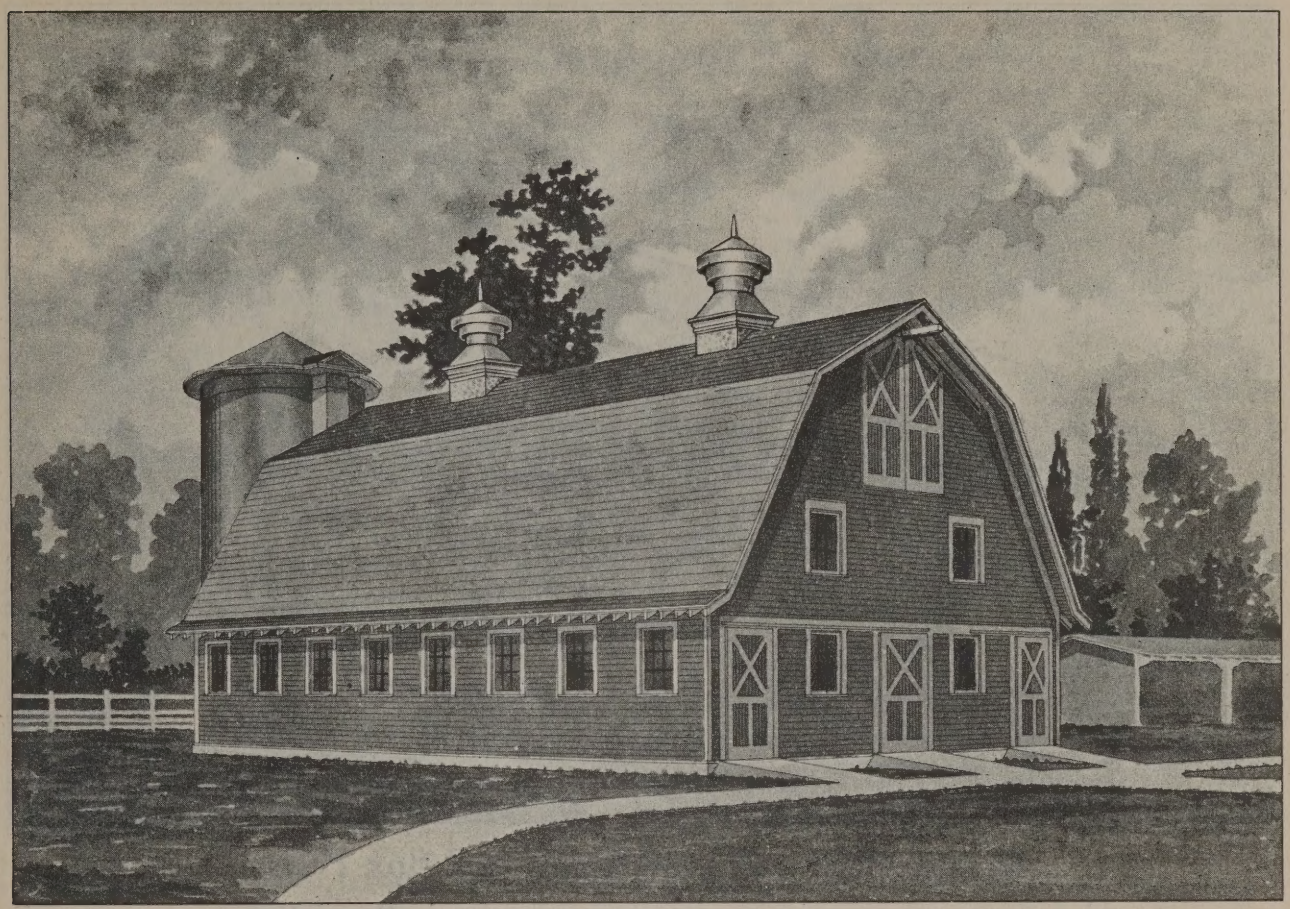
The cost is estimated to be $1950.00.

Price of Complete working plans and specifications for Design 2419 $5.00

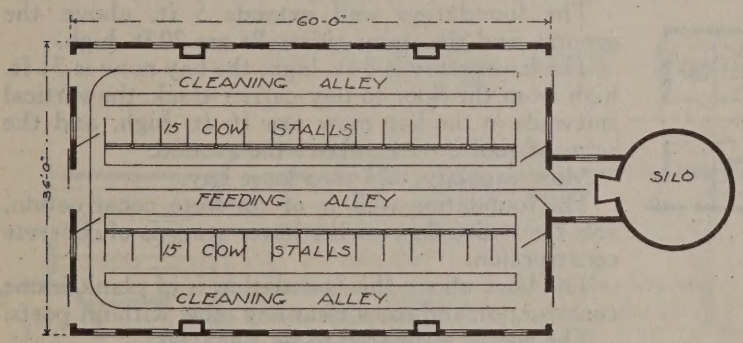
In this plan the cows are headed out, and there is a driveway through the center for the manure spreader, so the manure from the gutters may be loaded and hauled to the field with only one handling. The bedding is brought in by the wagon load through the same channel. Even when the storage barn is handy, a wagon is often used for this purpose. If either of the box cow pens are not in use, the extra bedding is pitched in there until wanted.

There is an over-head track which runs to the silo to carry silage at feeding time. The same track is supposed to run to the storage barn for alfalfa or other roughage.

The Louden Machinery Co.,
Gentlemen:
The Feed Carrier outfit I purchased from you has given entire satisfaction. I have used it for the past two winters and have never had a break. I can highly recommend it to anyone in need of a feed carrier.
Yours truly, J. W. Sanborn, Spring Grove, Ill.



Design 2140—For 30 Cows



Price of Complete working plans and specifications for Design 2140 $5.00

Description

This barn is 36 ft. wide by 60 ft. long. The side walls are 10 ft. high and top of roof is 32 ft.

The lower story is 9 ft. high and hay fork track in the upper story hangs 19 ft. above the mow floor.

The construction consists of a plank frame with self-supporting roof, having a clear hay mow without posts.

Mow capacity, 48 tons loose hay.

The foundation wall is of concrete extending above the dampness of the ground and the lower floor is of cement with cement mangers, gutters, etc.

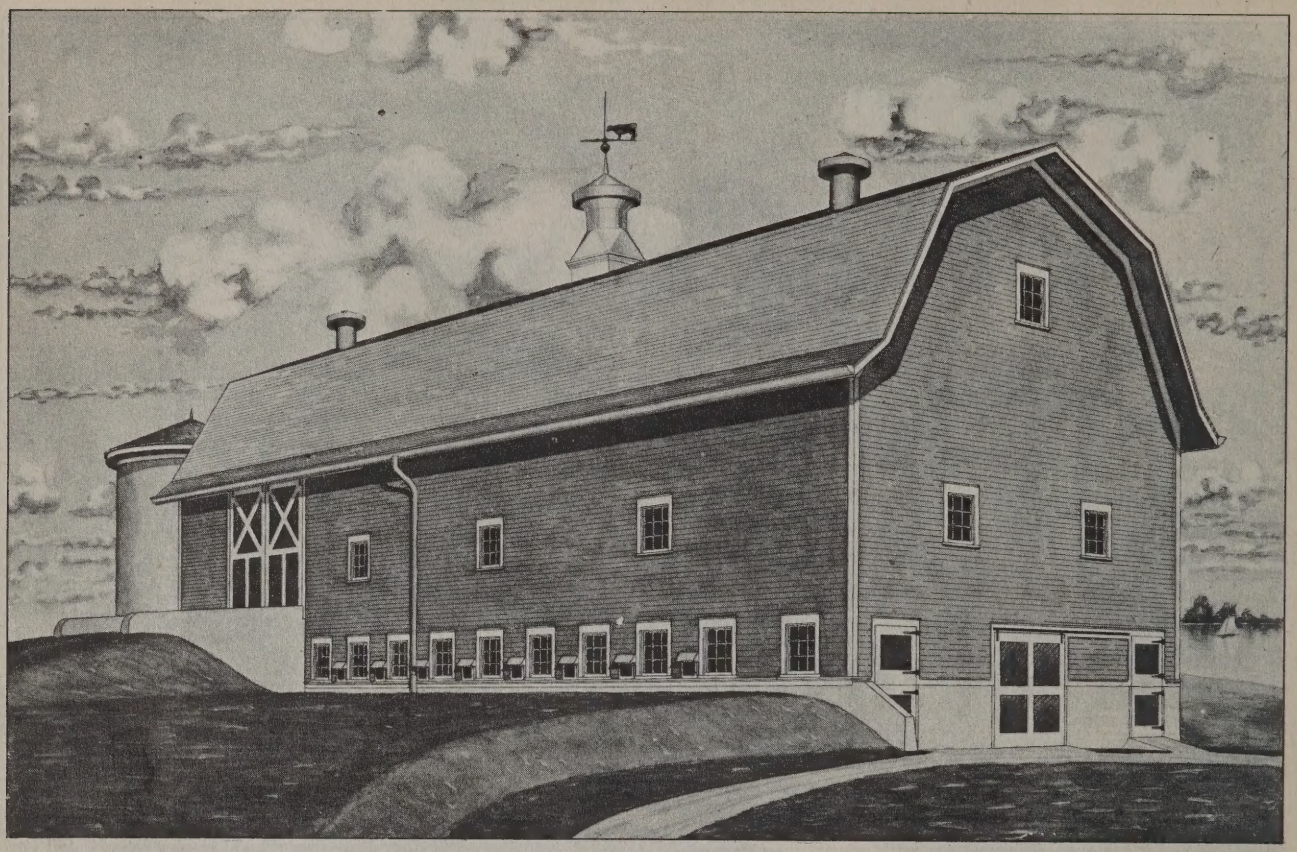
This barn contains 30 cow stalls facing a center feed alley running lengthwise of the building to the silo at one end.

The cost is estimated to be $1700.00.

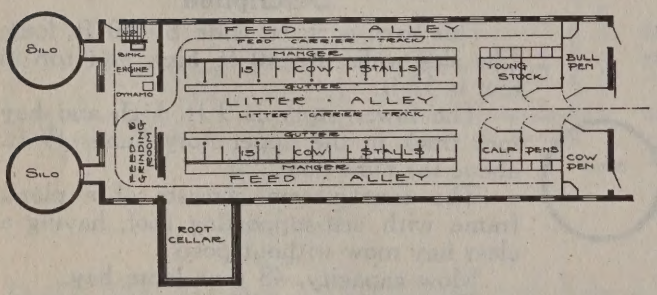
Gentlemen:

About six years ago I rebuilt my stable putting in some of your equipment and some of another make. Two years later I changed it to all Louden equipment and am very well satisfied. After six years constant use it is still strong enough to hold our biggest Holsteins. Yours truly,

F. H. Case, Guilderland, N. Y.



Design 2929—For 30 Cows and Box Pens



Description

This barn is 36 ft. wide by 100 ft. long.

The foundation wall extends 5 ft. above the ground, and the frame sidewalls are 20 ft. high.

The lower story is 8 ft. high, the hay mow is 31 ft. high from the floor to hay carrier-track, the vertical sidewalls in the hay mow are 16 ft. high, and the ridge of roof is 43 ft. above the ground.

Mow capacity, 124 tons loose hay.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $5000.00.

Price of Complete working plans and specifications for Design 2929 . . . . . $5.00

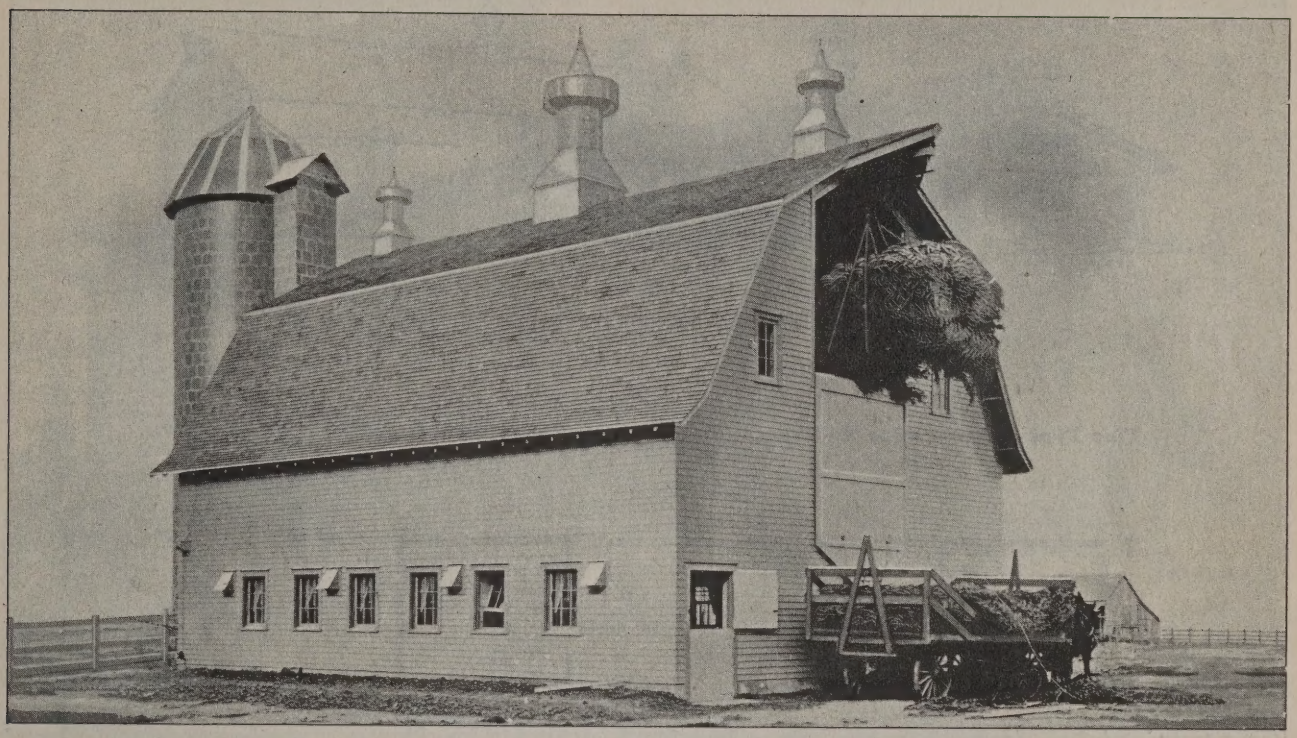
Louden Machinery Co.,
Sirs:

About twelve years ago I put a Louden hay carrier and track in my barn, and six years later a Louden litter carrier and track in basement of barn. They have both given the best of satisfaction. It is the only satisfactory way for getting the manure from a basement barn. Four years ago I built a silo and installed a feed carrier on the track in basement. It is convenient and a labor saver, as I feed ensilage both inside the barn and in the bunks outside of it. It beats carrying ensilage in a basket or cleaning stables on a wheelbarrow.

Yours respectfully,

W. F. Desemberg, Norwalk, Iowa.

Design 3643

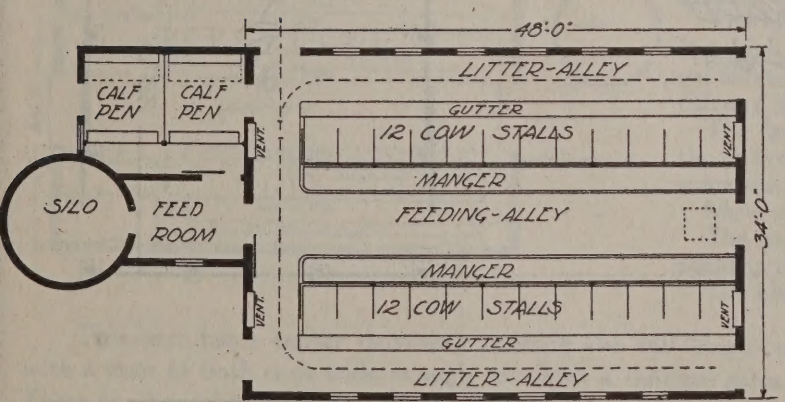


Exterior View of Dairy Barn Designed for Summit Farm, Adams County, Nebraska

Mrs. Anne V. Ward, Owner

A map of the farm on which this barn is located is illustrated on page 31.

Design 3643—For 24 Cows



Price of Complete working plans and specifications for Design 3643. $5.00

Description

This barn is 34 ft. wide by 48 ft. long. The side walls are 14 ft. high and top of roof is 34 ft.

The lower story is 8 ft. high and hay fork track in the upper story hangs 23 ft. above the mow floor.

The construction consists of a plank frame with self-supporting roof, having a clear hay mow without posts.

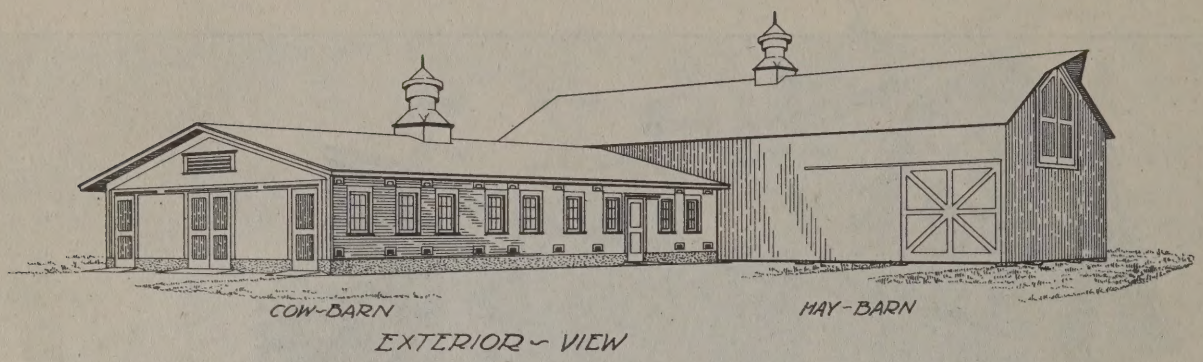
Mow capacity, 48 tons loose hay.

The foundation wall is of concrete extending above the dampness of the ground and the lower floor is of cement with cement mangers, gutters, etc.

This barn contains 24 cow stalls facing a center feed alley running lengthwise of the building to the silo at one end.

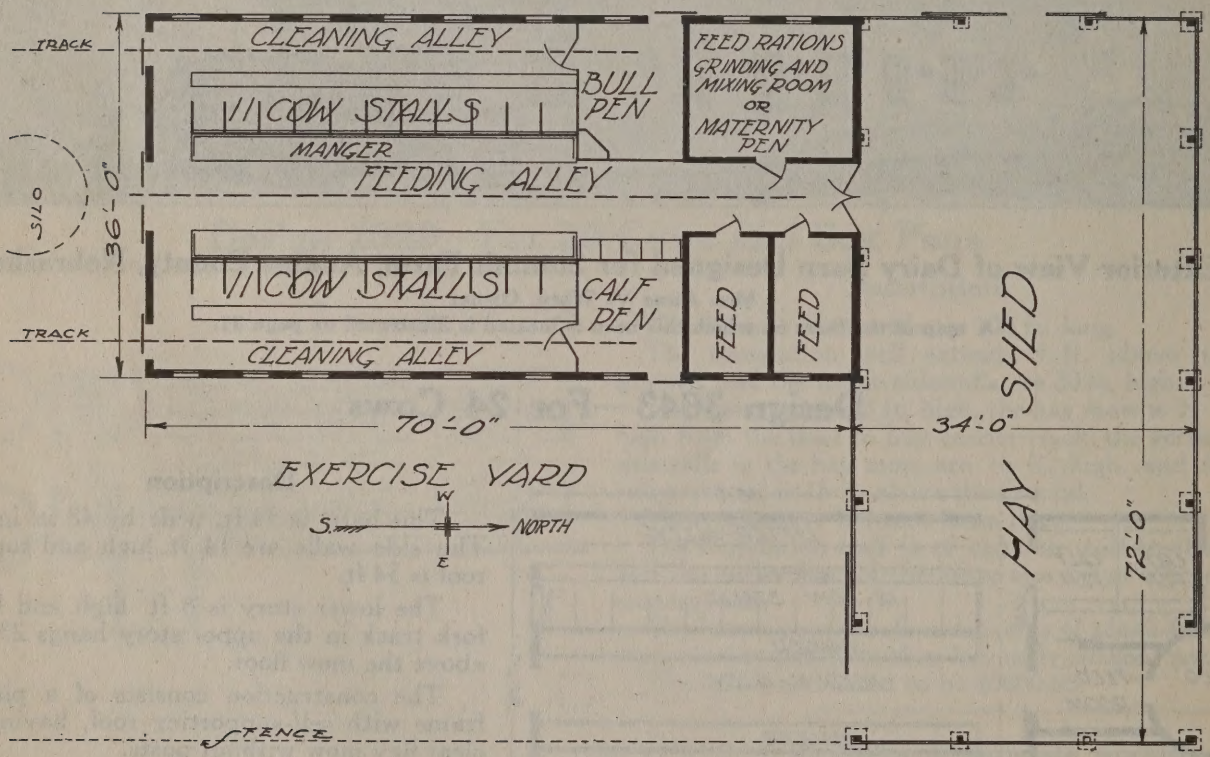
The cost is estimated to be $1700.00.

Design 4929



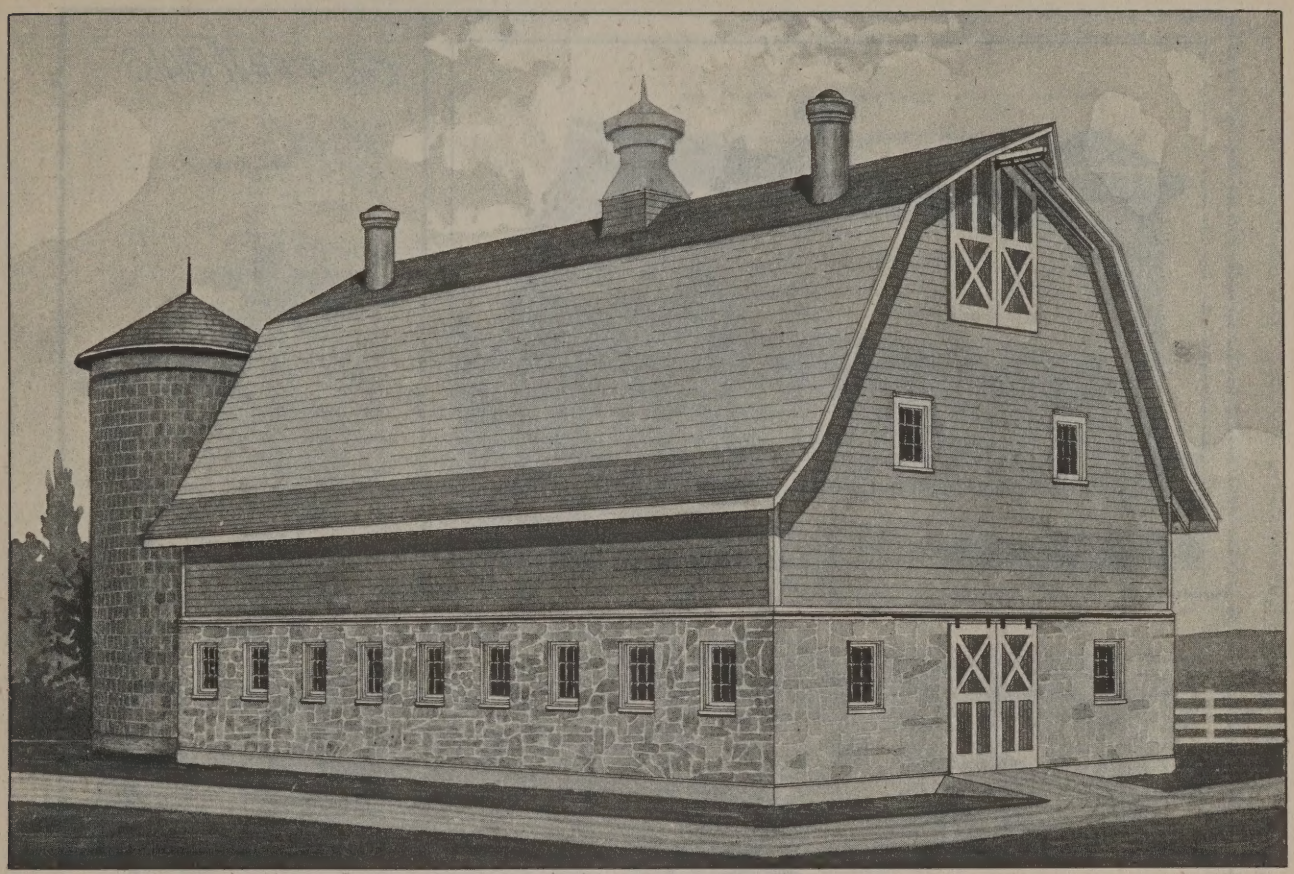
EXTERIOR ~ VIEW

This Type of Barn can be Built much Cheaper than a Two-story Barn of the same Capacity.

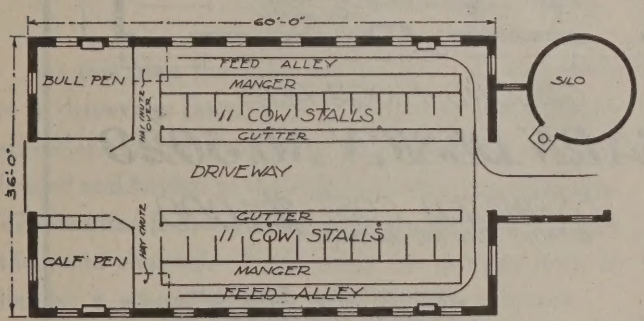


Total cost of hay barn	$ 633.51
Total cost of cow barn	1,763.83
Complete cost	$2,397.34

Price of Complete working plans and specifications for Design 4929 $5.00



Design 1657—For 22 Cows



Description

This barn is 36 ft. wide by 60 ft. long.

The foundation wall extends 10 ft. above the ground and the frame sidewalls are 8 ft. high.

The lower story is 9 ft. high, the hay mow is 25 feet high, from floor to hay carrier track, the vertical sidewalls in the hay mow are 7 ft. high and the ridge of roof is 38 ft. above the ground.

The basement wall is of stone construction and the entire floor of the lower story is of concrete construction.

Mow capacity 80 tons loose hay.

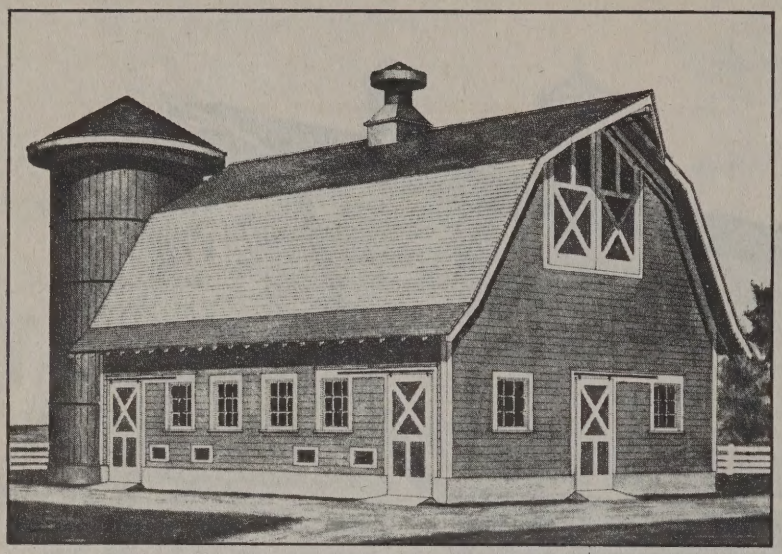
The barn above the basement is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $2200.00.

This barn has a center driveway running the full length of it with a door at both ends wide enough to admit a manure spreader. There is a hay chute over each feed alley and a feed carrier track running to the silo.

Price for Complete working plans and specifications of Design 1657..... $5.00

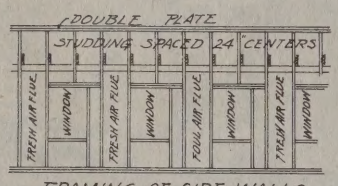
Dear Sirs:
Will say in reference to the Louden Stanchions that they have given perfect satisfaction. Would not do without them for twice what they cost.
Respectfully,
W. A. McKENZIE, Springville, Utah



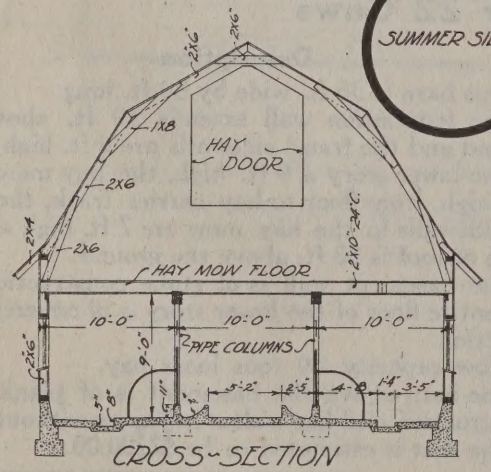
EXTERIOR-PERSPECTIVE-VIEW

BILL OF MATERIALS

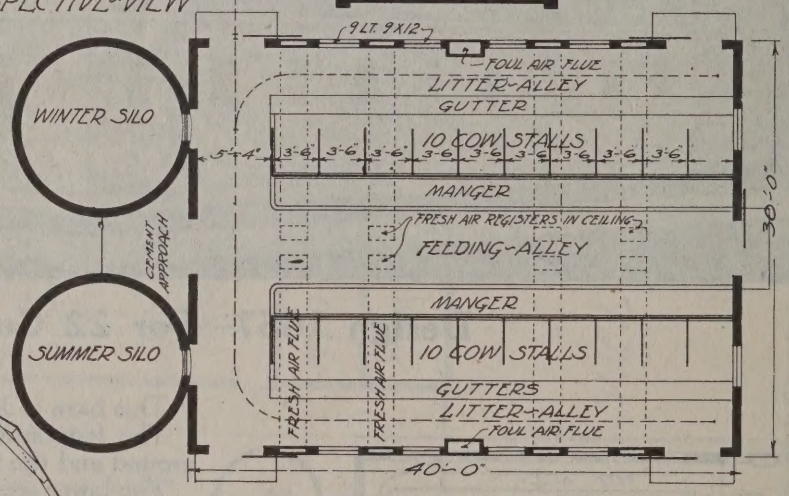
190 SACKS CEMENT
22 YDS. SAND
37 YDS. GRAVEL
4 PIPE COLUMNS 3½ EXTRA 8'-6"
8 SILLS 2X6 - 16'
8 " 2X6 - 14'
10 PLATES 2X6 - 16'
4 " 2X10 - 16'
4 " 2X10 - 14'
92 STUDDING 2X6 - 10'
24 " 2X6 - 14'
6 RIBBONS 2X6 - 14'
24 GIRDERS 2X10 - 14'
42 JOIST 2X10 - 16'
22 BRIDGING 2X4 - 12'
44 RAFTERS 2X6 - 12'
44 " 2X6 - 10'
44 LOOKOUTS 2X4 - 4'
38 BRACES 2X6 - 6'
76 " 1X8 - 8'
19 COLLAR BEAMS 2X6 - 4'
2,150' DROP SIDING 1X6
1400' 1X6 FLG. FOR INTERIOR SIDEWALLS
1400' 1X6 FLG. FOR MOW FLOOR
13,00' ⅜" BEADED CEILING
1,500' 1X6 SHEATHING
20,000 SHINGLES
350 FT. CYPRESS FINISH, CORNERS ETC.
10 SASH 9 LT. 9X12 & FRAMES COMPLETE
1-24" LOUDEN CUPOLA



FRAMING OF SIDE WALLS



CROSS-SECTION



GROUND-FLOOR-PLAN

BARN DESIGN NO. 5029

ESTIMATED COST $1,000.
WITHOUT SILOS AND EQUIPMENT

ARCHITECTURAL DEPARTMENT
LOUDEN MACHINERY CO.
FAIRFIELD, IOWA.

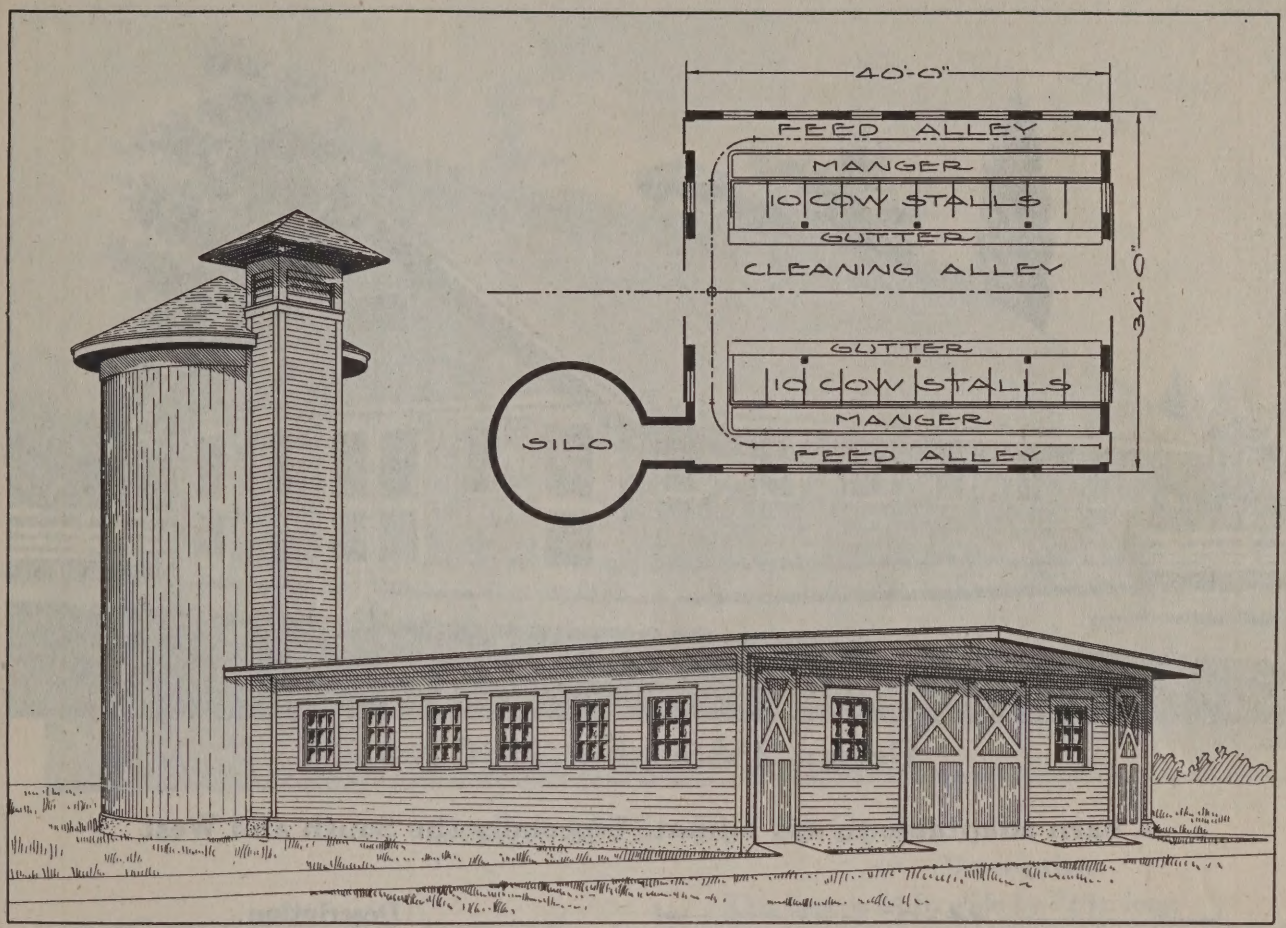
Design 5029

The braced rafter construction of this roof is the most practical and economical ever designed for a clear-span mow, having no posts, trusses or beams to interfere with the hay.

With this type of construction the cows may be faced in or out, as preferred. The King system of ventilation is used.

If you prefer this type of barn, but require a greater capacity than the plan shows, you can figure the length of the barn you require by adding 3½ feet in length for every two additional cows you wish to house. To estimate the additional cost, add $21.00 for each foot added to the length of the barn.

Complete working plans and specifications, $6.00 per set.



Design 3152—For 20 Cows

In this plan the cows are headed out, and there is a driveway through the center for the manure spreader, so the manure from the gutters may be loaded and hauled to the field with only one handling. The bedding is brought in by the wagon load through the same channel. Even when the storage barn is handy, a wagon is often used for this purpose.

There is an over-head track which runs to the silo to carry silage at feeding time. The same track is supposed to run to the storage barn for alfalfa or other roughage.

Description

This barn is 34 ft. wide by 40 ft. long.

The foundation wall extends 18 inches above the floor, and the frame sidewalls are 9 ft. high.

The story is 9 ft. high, and the ridge of roof is 12 ft. above the ground.

The foundation wall is of concrete construction, and the entire floor of the barn is of concrete construction.

The barn above the foundation is of plank-frame construction.

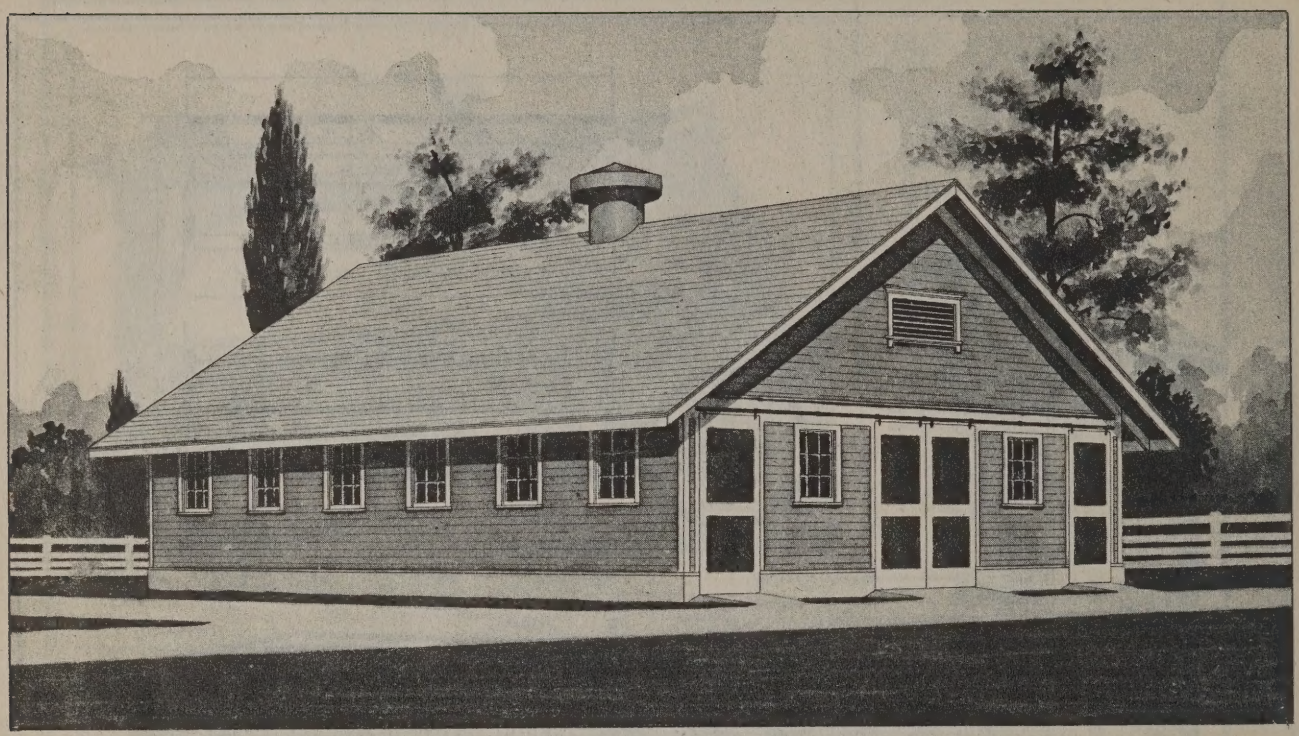
The cost is estimated to be $500.00.

Price of Complete working plans and specifications for Design 3152 ..... $5.00

Dear Sirs:

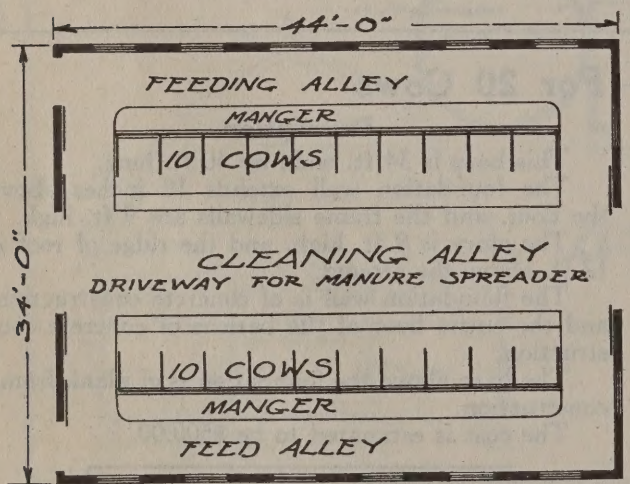
In 1911 I purchased a six tine balance grapple fork of you with track and carrier. Since then I have bought more of your barn equipment. All have, and are giving, the very best of service and I shall always remember you when in need of anything in your line.

Very truly,
N. L. Kingsley, Edinboro, Pa.



Design 2585 — For 20 Cows

A barn adaptable to any climate especially the South and West



Description

This barn is 34 ft. wide by 44 ft. long.

The foundation wall extends 18 inches above the ground and the frame sidewalls are 8 ft. high.

The story is 9 ft. high.

The foundation wall is of concrete construction and the entire floor is of concrete construction.

The barn above the foundation is of plank-frame construction and has a clear span without posts.

The cost is estimated to be $800.00.

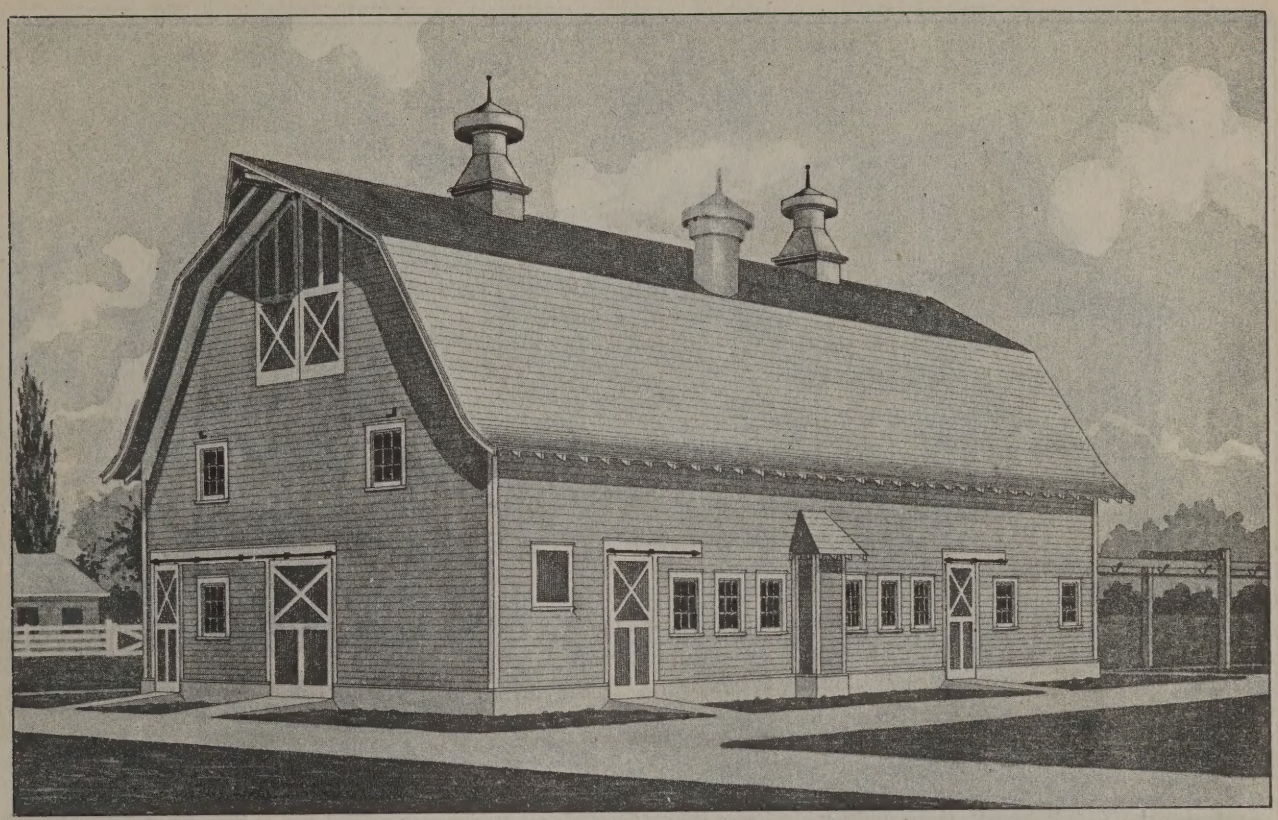
Price of Complete working plans and specifications for Design 2585 ..... $5.00

Gentlemen:

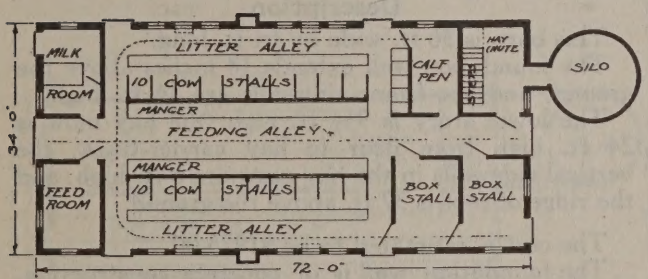
Some years ago we bought one of your litter carriers with track, in all 400 feet of track. Two years ago we got one more, about 250 feet of track. I must say we think there is no carrier nor track manufactured that can come up to this. It is handy to raise and lower, and strong. It has not caused us any trouble nor five cents for repairs in all these years. We can not say too much for this outfit; would not be without it for double the price.

Yours,

T. T. Johnson, Whalana, Minn.



Design 1675—For 20 Cows



While the dairy barn should be located where it will be most convenient for the handling of stock, feed, litter, and milk, it should also be arranged to suit its location. This barn suits a certain location and makes a good design where the silo is on the same end as the entrance for litter carrier and where milk and hay is handled at the other end.

Description

This barn is 34 ft. wide by 72 ft. long.

The foundation wall extends 18 inches above the ground, and the frame sidewalls are 14 ft. high.

The lower story is 9 ft. high, the hay mow is 21 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 5 ft. high, and the ridge of roof is 34 ft. above the ground.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

Mow capacity, 80 tons loose hay.

The barn above the foundation is of plank frame construction and has a clear hay mow without posts.

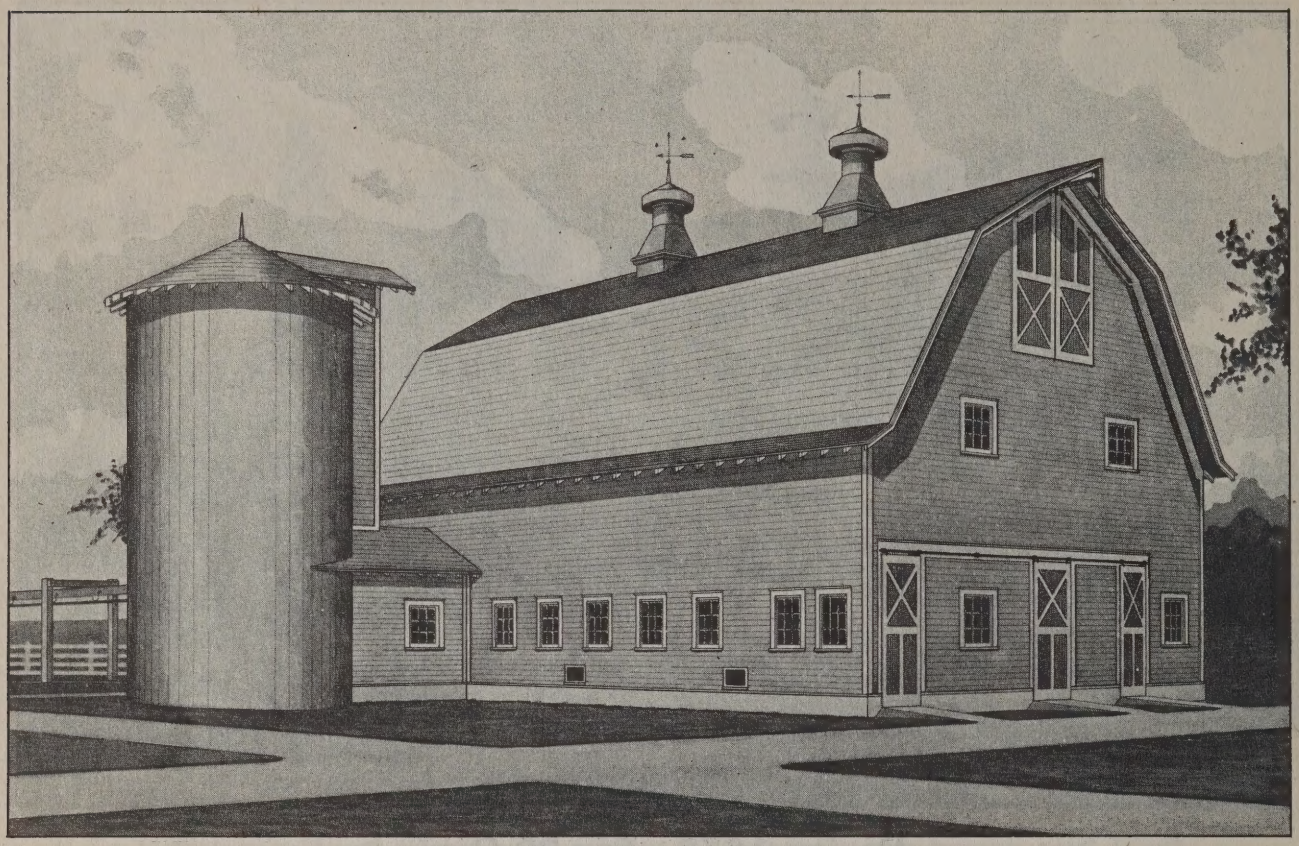
The cost is estimated to be $2260.00.

Price of Complete working plans and specifications for Design 1675 ..... $5.00

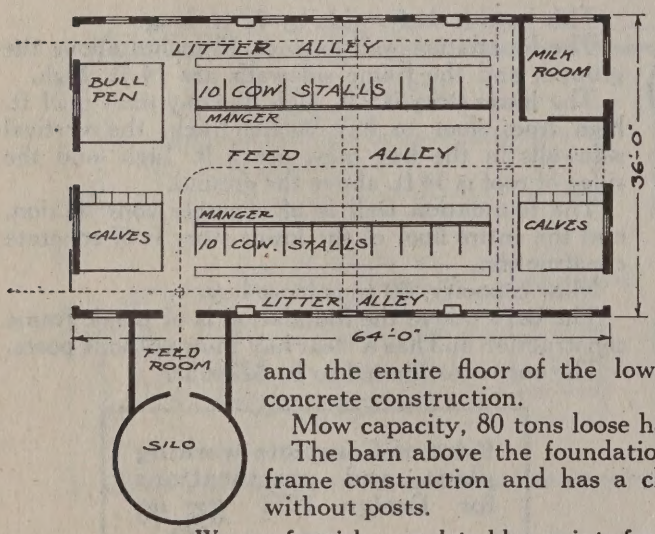
Gentlemen:

The Louden Stanchions that we purchased from you for our new certified dairy cow barns are a great success. They are neat and handy in their working and fill the requirements in every respect. We have frequent occasion to recommend them strongly to others who are constructing up-to-date dairy buildings, and certainly would buy them again in equipping dairy buildings.

Yours very truly,
E. L. Thompson, Pres.,
Clover Hill Farms, Portland, Ore.



Design 2556—For 20 Cows



Description

This barn is 36 ft. wide by 64 ft. long.

The foundation wall extends 18 inches above the ground, and the frame sidewalls are 16 ft. high.

The lower story is 9½ ft. high, the hay mow is 24 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 6 ft. high, and the ridge of roof is 37 ft. above the ground.

The cost is estimated to be $1975.00.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

Mow capacity, 80 tons loose hay.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

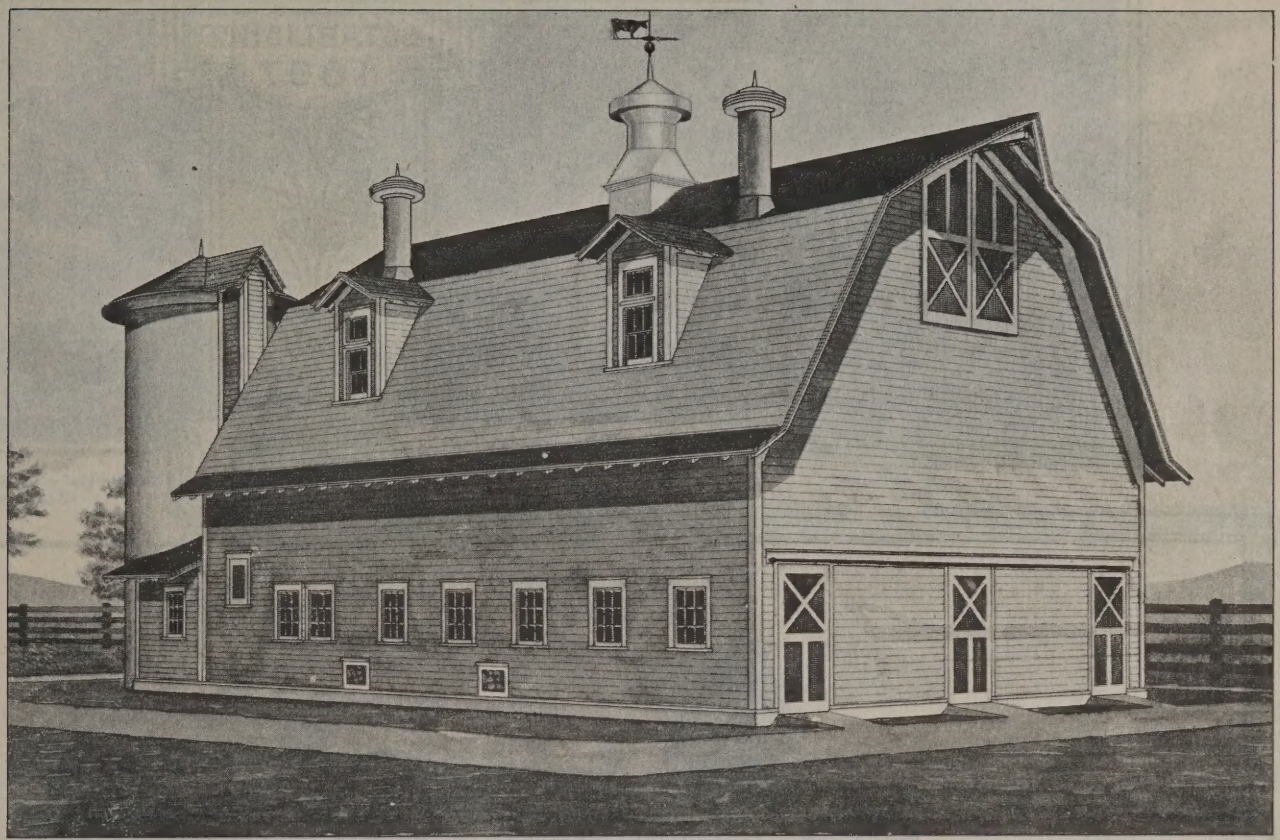
Price of Complete working plans and specifications for Design 2556 ..... $5.00

We can furnish complete blue-prints for any building illustrated in this book.

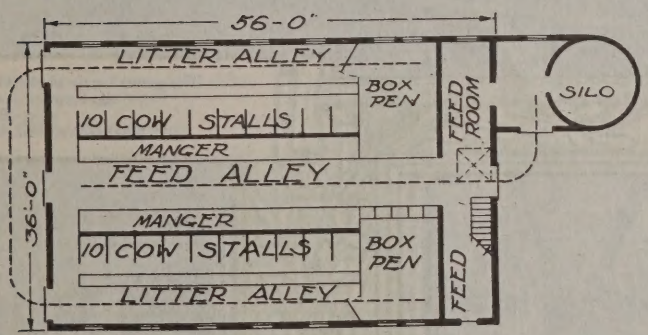
Louden Machinery Co.

Dear Sirs: Last Fall we remodeled our stables fitting them out with the Louden steel stalls, and can recommend them as being easy to operate, impossible for the cattle to unlock, and perfectly satisfactory in every respect. The mangers too, we built after your plan, and find they answer a double purpose, as they not only eat from them, but they drink from them as well, it having been inconvenient to install water basins on account of the cold weather.

Yours truly,
M. L. Haley,
Springford, Ontario.



Design 1602—For 20 Cows



Description

This barn is 36 ft. wide by 56 ft. long.

The frame sidewalls are 14 ft. high.

The lower story is 9 ft. high, the hay mow is 22 ft. high from floor to hay carrier-track, and the ridge of roof is 34 ft. above the ground.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

Mow capacity 70 tons loose hay.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $1800.00.

The second story has a capacity for 60 tons of loose hay and space for additional bins if they should be wanted.

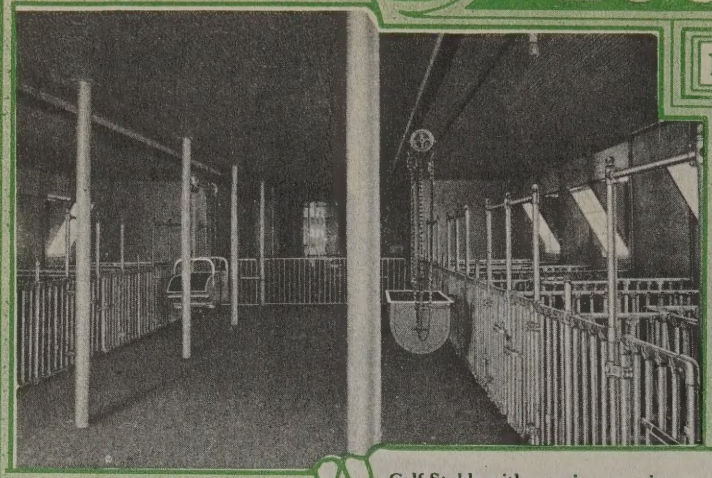
Special attention has been given this design as to light and ventilation.

Price of Complete working plans and specifications for Design 1602 ..... $5.00

Louden Machinery Company,
Gentlemen: After trying different tracks and hangers on my heavy barn door, I am satisfied with the Louden.
Yours truly
(Signed) SAMUEL H. MARTIN, Whitewood, South Dakota

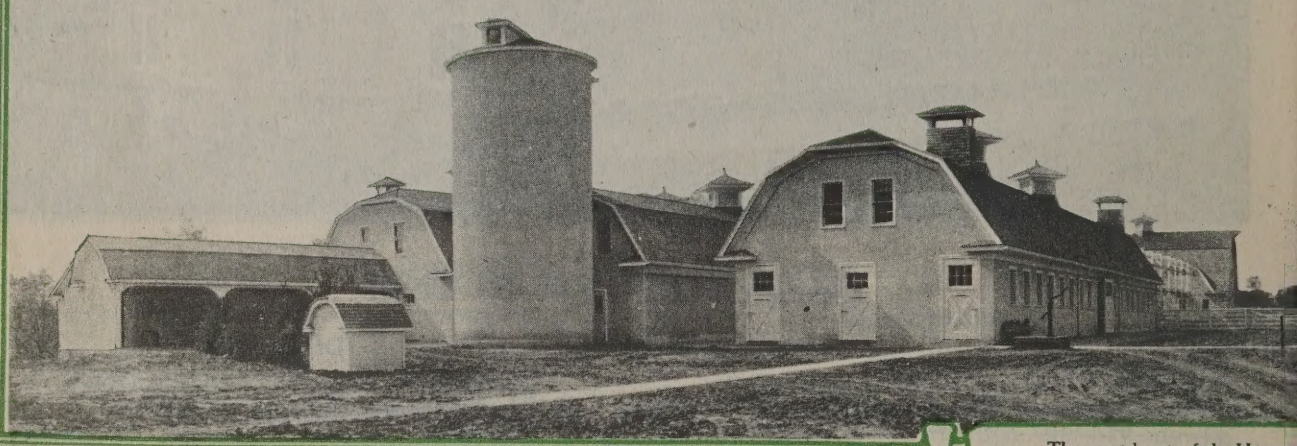
LOUDEN MACH

ESTABLISHED
1867



Calf Stable with exercise court in center at Homewood Farms

Main Dairy Barn, Ho
32 Louden Sta



The great barns of the Homew
the Louden Architec
through
Owned by Wm. Butter

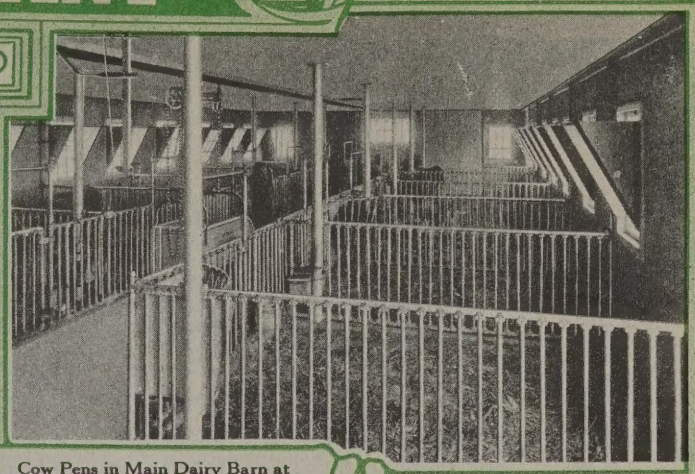
Teat Barn at Homewood Farms. Louden Pens and Feed Carrier

Hospital Barn, Home
used for Hospit
Bu

NERY COMPANY

FAIRFIELD
IOWA

rms. In this building are
Louden Box Stalls



Cow Pens in Main Dairy Barn at
Homewood Farms. Louden planned
and equipped

at Moline, Illinois, were planned by
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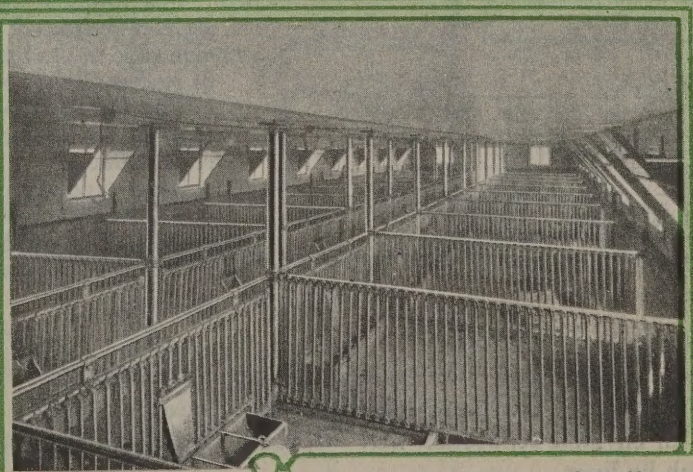
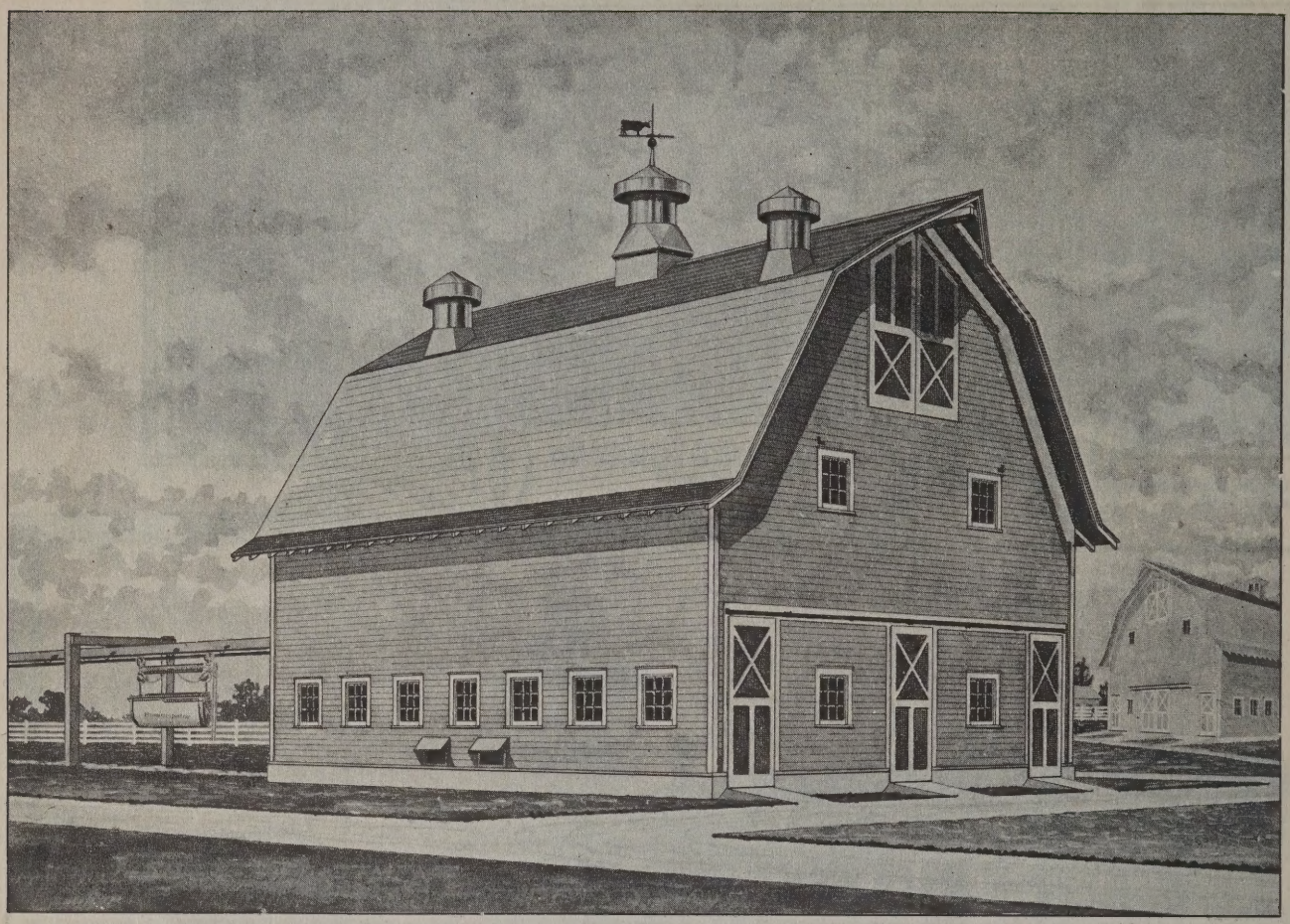
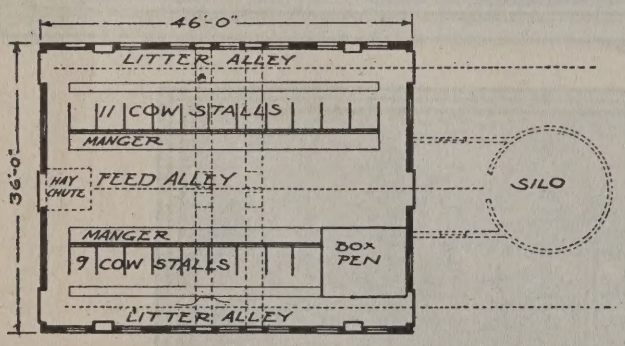


Louden planned and equipped Hog House at
Homewood Farms



Design 2562—For 20 Cows



Description

This barn is 36 ft. wide by 46 ft. long.

The foundation wall extends 18 inches above the ground, and the frame sidewalls are 16 ft. high.

The lower story is 10 ft. high, the hay mow is 24 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 6 ft. high, and the ridge of roof is 37 ft. above the ground.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

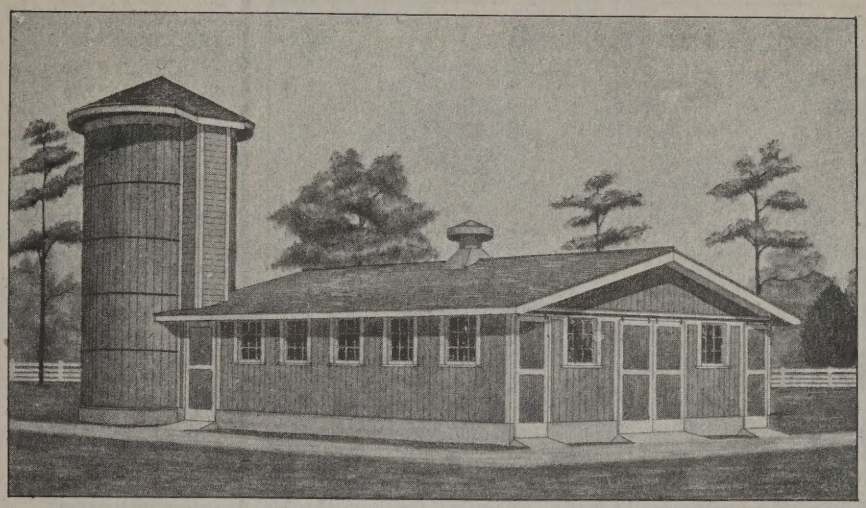
Mow capacity, 55 tons loose hay.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $1500.00.

The man who keeps good stock and builds good buildings to house them, is the man to succeed and build up a business that will give him an enviable reputation that will reach far beyond the county in which he lives.

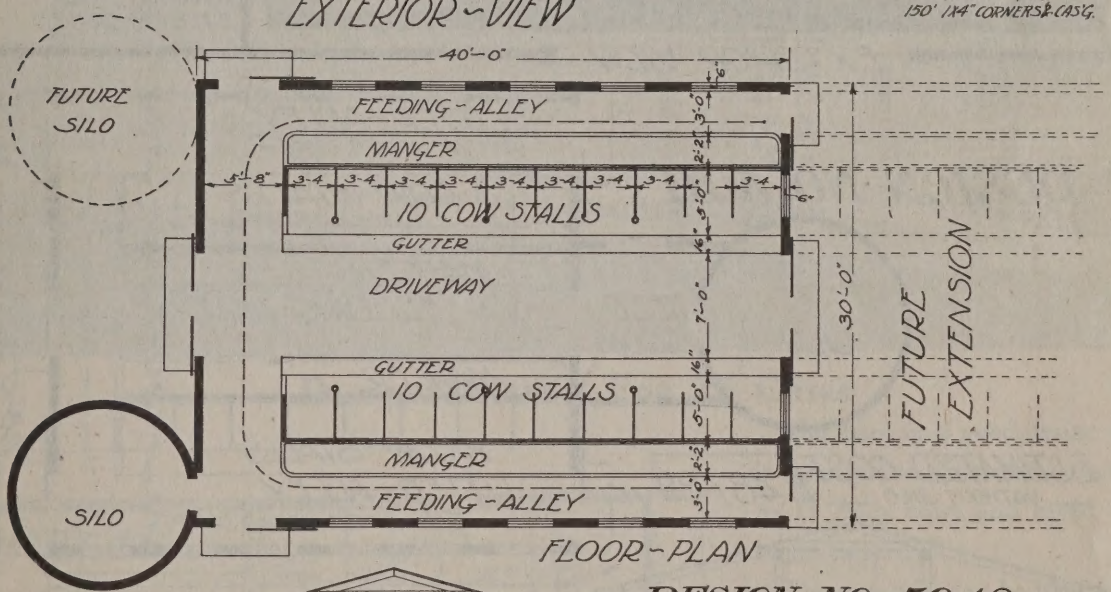
Price of Complete working plans and specifications for Design 2562 ..... $5.00



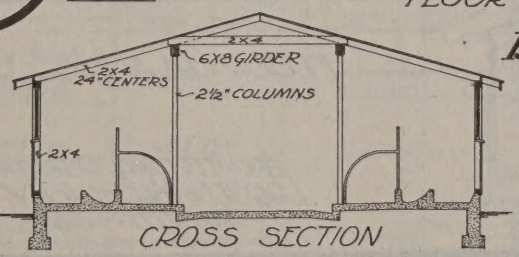
EXTERIOR - VIEW

LIST OF MATERIALS

163 SACKS CEMENT
20 CU. YDS. SAND
30 CU. YDS. GRAVEL
6 PIPE COLUMNS 2½" X 10'
24 - 2X4" - 12'
24 - 2X4" - 14'
10 - 2X4" - 16'
8 - 2X4" - 18'
84 LIN. FT. 6X8"
46 - 2X4" - 18'
21 - 2X4" - 12'
1350' 1/8" D.R.M. SIDING
1800' SHIP LAP SHEATHING
16 SQ. 3 PLY ROOFING
12 WINDOW FRAMES
12 SASH 9 LT. 9X12
150' 1X4" CORNERS & CAS'G.



FLOOR - PLAN



CROSS SECTION

DESIGN NO. 5042

ESTIMATED COST $540
WITHOUT SILO AND EQUIPMENT

ARCHITECTURAL DEPARTMENT
LOUDEN MACHINERY CO.
FAIRFIELD - IOWA.

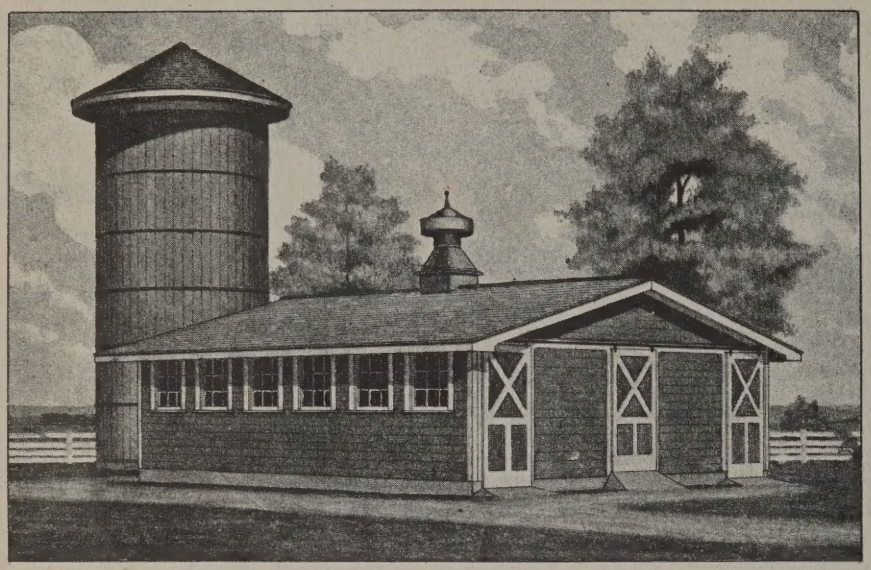
Design 5042

If you are starting with a few cows, and expect to increase your herd from year to year, adopt this design. It has been pronounced the most economical barn construction.

At the estimate given, the barn would cost $27.00 per cow, including concrete foundation, floor, and mangers. If desired the barn may be left unfinished inside, temporarily, and when the profits from the herd justify the expense it may be boarded, ceiled, or plastered.

The capacity of the barn may be increased at any time by simply building on any additional length required to meet the growth of the herd.

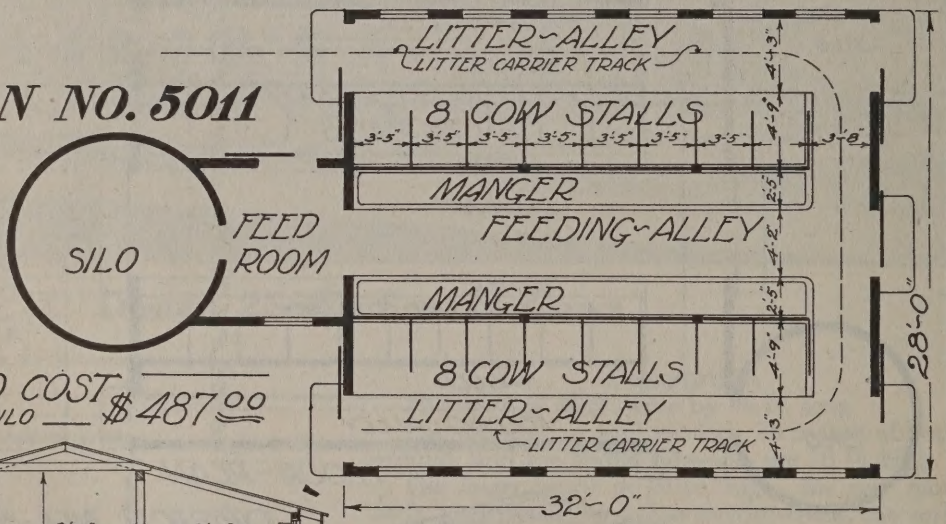
Complete working plans and specifications, $5.00 per set.



EXTERIOR VIEW

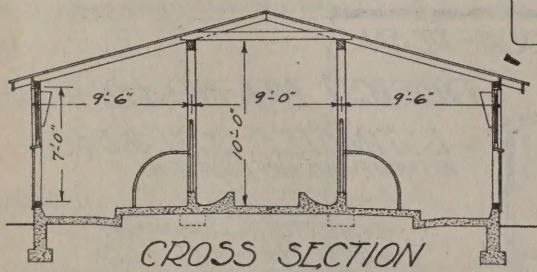
BILL OF MATERIALS
4 POSTS 6X6-10'
16 PLATES 2X4-16
16 " 2X4-14
8 " 2X4-10
19 STUDDING 2X4-14
10 " 2X4-16
8 " 2X4-12
6 BEAMS 6X8-12
38 RAFTERS 2X4-16
15 CEIL'G. JOIST 2X4-10
3 WIND. SILL 2X6-12
1200 FT. DROP SIDING
1500 FT. ROOF SHEATHING
12 SQ. 3 PLY ROOFING
130 FT. 1X6 FLG. FOR DOORS
150 FT. 1X4 TRIM
144 LIN. FT. SASH STOP
12 SASH 9 LT. 9X12
158 SACKS CEMENT
18 CU. YDS. SAND
34 CU. YDS. GRAVEL

DESIGN NO. 5011



FLOOR PLAN

ESTIMATED COST — WITHOUT SILO — $487.00



CROSS SECTION

ARCHITECTURAL DEPARTMENT
LOUDEN MACHINERY CO.
FAIRFIELD — IOWA

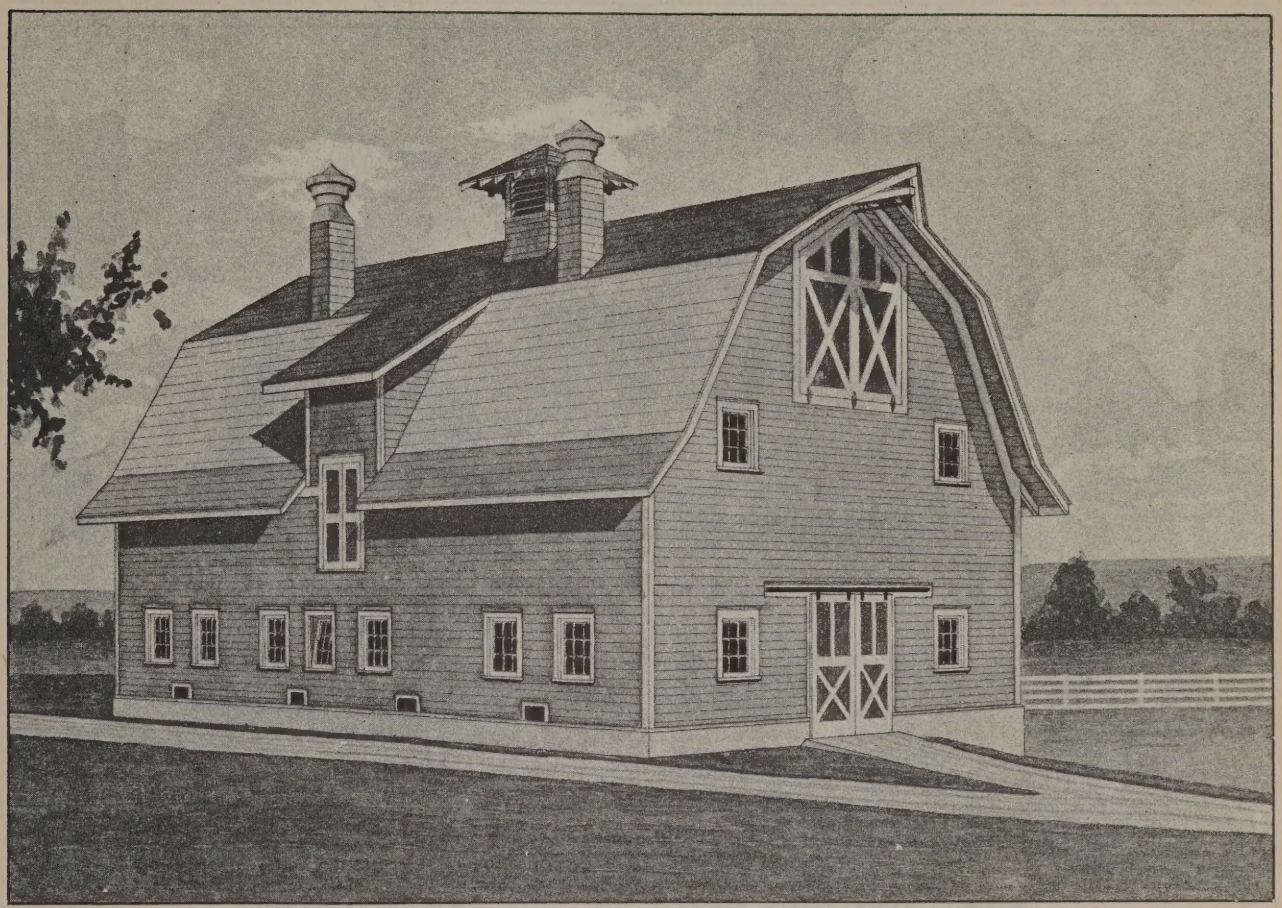
Design 5011

This barn, though inexpensive, is so designed that every stick of timber and every foot of space will render maximum service.

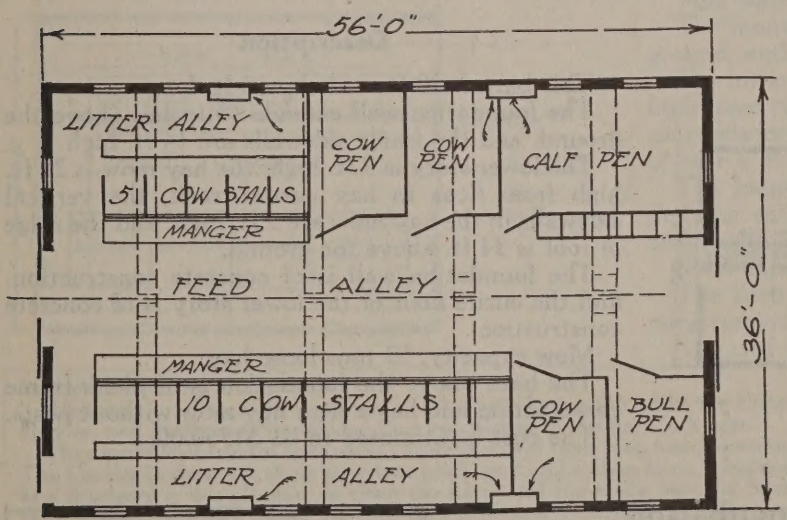
The construction is extremely simple, but is carefully planned to give the proper amount of air space and window surface for each cow, to provide the most convenient arrangement for feeding and barn cleaning, and to meet the various other conditions that enter into the building of a modern barn.

The plan shown is for 16 cows. It is a very simple matter to add to the length of the barn as your herd grows.

Complete working plans and specifications, $5.00 per set.



Design 2600B—For 15 Cows



This barn is of good design where it is intended to start with a herd of 10 to 15 dairy cows and breed up to a larger capacity.

The cow pens can be used for young stock, yearlings and two year olds until the herd is large enough to fill the barn with milch cows alone. Then the pens can be removed and placed in a separate barn and their place in the barn provided with additional cow stalls, giving the barn a capacity of 28 cows.

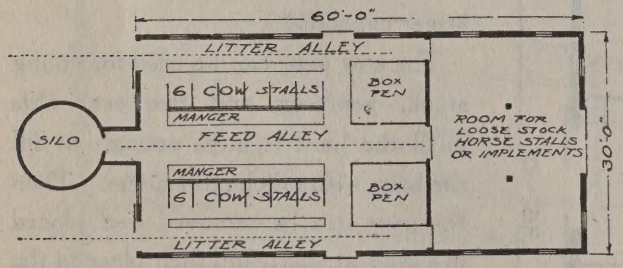
This barn is designed so it can be built in the bank of a hill and by excavating under one half of the barn a basement about 18x56 ft., outside measurements can be had for storage of implements or for a shelter shed for loose stock.

Mow capacity, 57 tons loose hay.

The cost is estimated to be $2300.00.

Price of Complete working plans and specifications for Design 2600B $5.00

Design 2564—For 12 Cows



Description

This barn is 30 ft. wide by 60 ft. long.

The foundation wall extends 18 inches above the ground, and the frame sidewalls are 14 ft. high.

The lower story is 9 ft. high, the hay mow is 21 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 5 ft. high, and the ridge of roof is 34 ft. above the ground.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

Mow capacity, 53 tons loose hay.

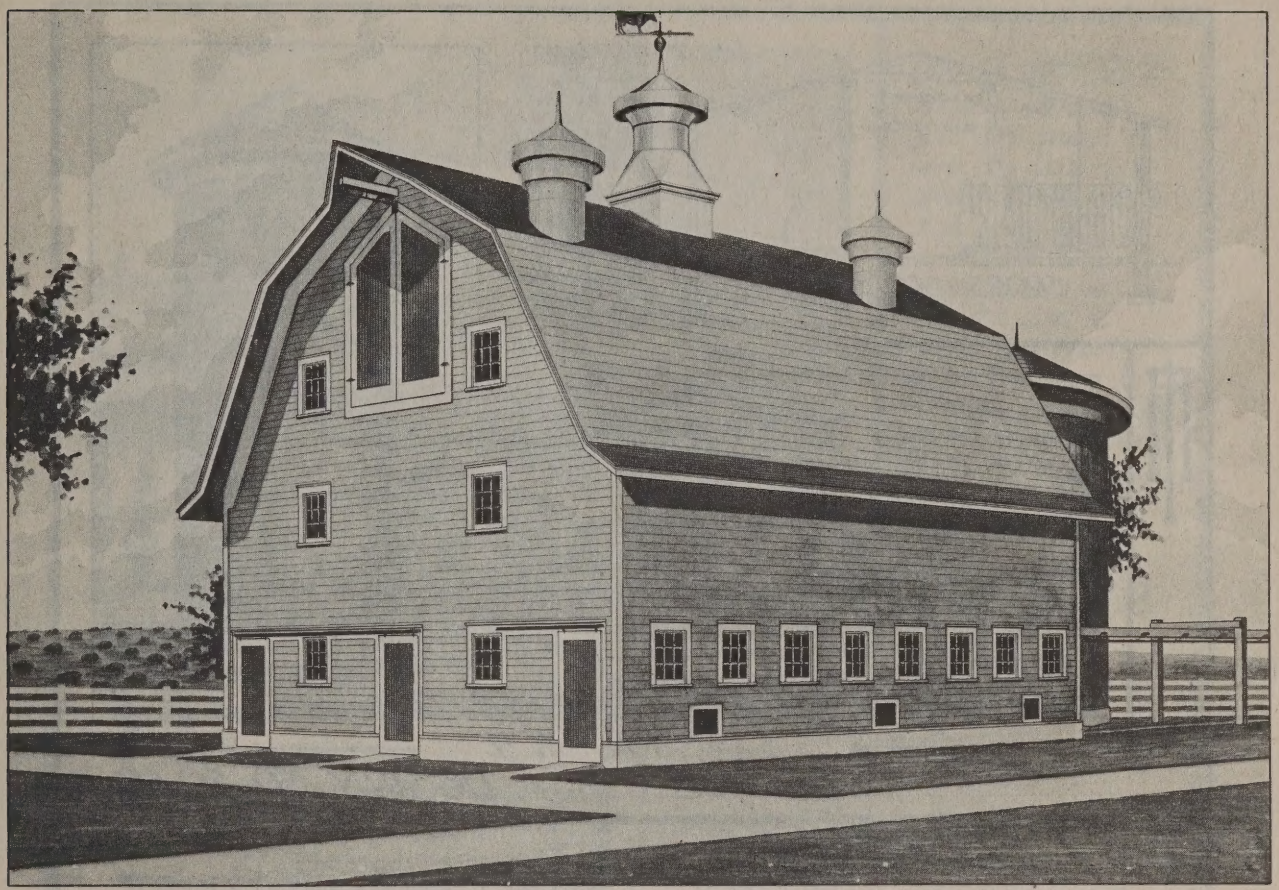
The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $1750.00.

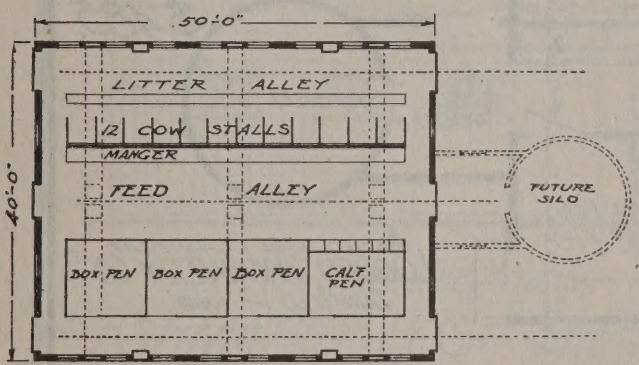
Average Periods of Incubation

Chickens	20–22 days	Guinea fowls	28 days
Geese	28–34 days	Pheasants	25 days
Ducks	28 days	Ostriches	40–42 days
Turkeys	27–29 days	Pigeons	18 days
Canary birds	14 days		

Price of Complete working plans and specifications for Design 2564 ..... $5.00



Design 2558—For 12 Cows and Box Pens



Description

This barn is 40 ft. wide by 50 ft. long.

The foundation wall extends 18 inches above the ground, and the frame sidewalls are 16 ft. high.

The lower story is 9 ft. high, the hay mow is 26 ft. high from the floor to hay carrier-track, the vertical sidewalls in the hay mow are 8 ft. high, and the ridge of roof is 39 ft. above the ground.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

Mow capacity, 64 tons loose hay.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $1600.00.

Louden Machinery Company,

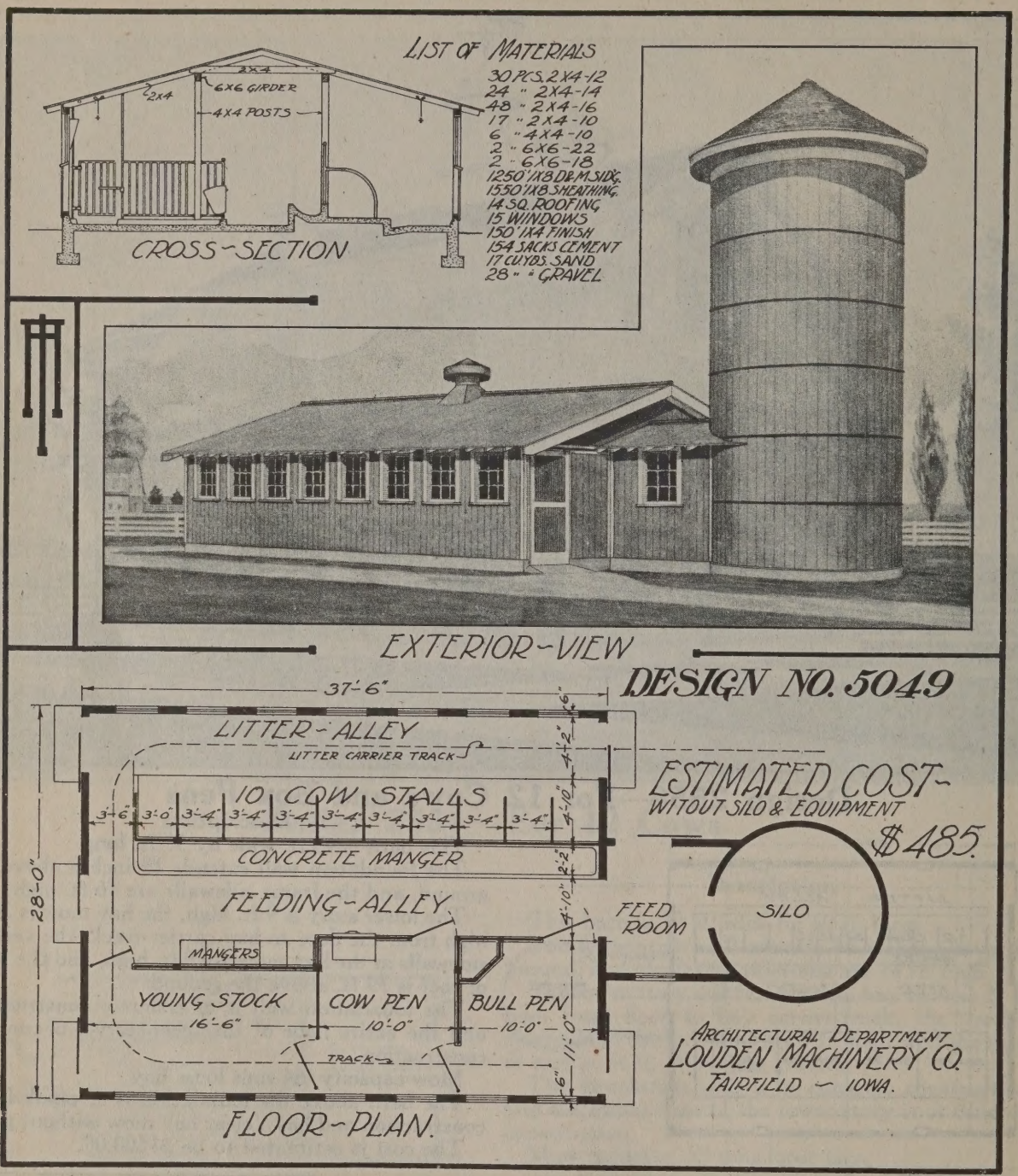
Gentlemen: I want to write you and tell you how much I like the Litter Carrier, and Stalls and Stanchions that you placed in my barn last year.

They are without doubt the greatest labor savers of their kind that I know of. The Carrier is the great thing to induce good work and a clean barn. Instead of a drudgery it is a pleasure to clean the barn, and the track that we have takes the manure away from the barn door and makes it cleaner for the cows and attendants to get in and out. It has the old wheelbarrow "Skinned a Block," and we could not get along without it. The carrier saves all of the manure, as we have placed the cement floor in the barn following the plans that your agent gave me free. We find it a good thing, and do not know how we got along so long without either of these improvements. That calf stall certainly is the finest thing of its kind going.

Yours truly, Fred. W. Green, Decatur, Mich.

Price of Complete working plans and specifications for Design 2558 ..... $5.00

If your neighbor is going to build tell him about this book—and do both him and us a good turn.

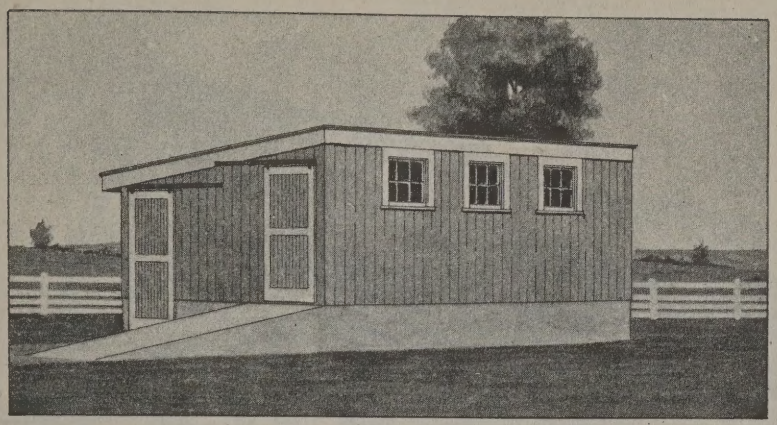


Design 5049

Compare this barn design, for 20 cows, with design 5029, of the same capacity, but with hay storage overhead. The estimated cost of this barn is $485.00; of the other, $1,000.00. In other words, with the two-story type of barn you pay $515.00 for sheltering 24 tons of hay, which could be stored in a shed at one end of the one-story barn at a cost of $130.00.

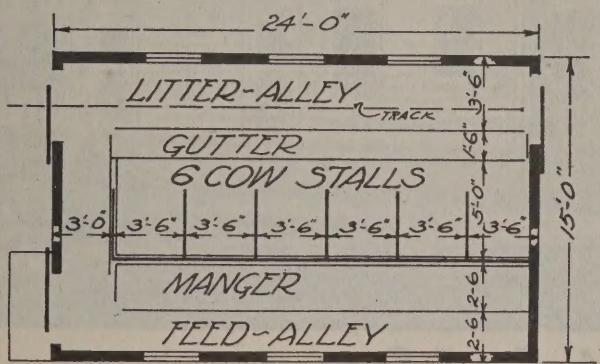
This statement is not intended to discourage the building of the two-story barns. The barn illustrated in design 5029 is a beautiful building and has many points in its favor. Where economy is an important factor, the one-story barn meets every requirement without sacrificing any of the features essential to comfort, cleanliness, and efficiency.

Complete working plans and specifications, $5.00 per set.



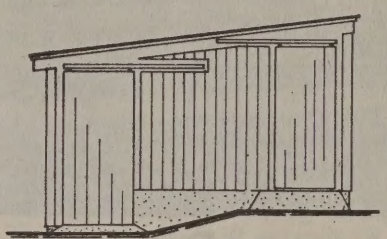
EXTERIOR - VIEW

BILL OF MATERIAL
70 SACKS CEMENT
8 CU. YDS. SAND
14 CU. YDS. GRAVEL
12 ANCHOR BOLTS 5/8 X 18"
2 SILLS 2X4 - 16'
4 SILLS 2X4 - 12'
6 PLATES 2X4 - 16'
4 GIRTS 2X4 - 16'
10 RAFTERS 2X6 - 16'
18 STUDDING 2X4 - 16'
700 FT. 1X8" MATCHED SIDING
480 FT. SHIPLAP SHEATHING
5 SQ. FELT 3 PLY ROOFING
6 SASH 6 LT. 10"X12"
6 WINDOW FRAMES

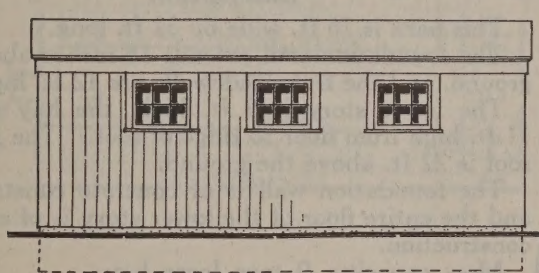


FLOOR - PLAN

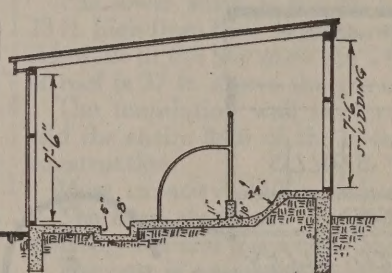
DESIGN NO. 4842



END - ELEVATION



SOUTH - SIDE - ELEVATION



CROSS - SECTION

ESTIMATED COST $187.80
WITHOUT EQUIPMENT

ARCHITECTURAL DEPARTMENT
LOUDEN MACHINERY CO
FAIRFIELD - IOWA.

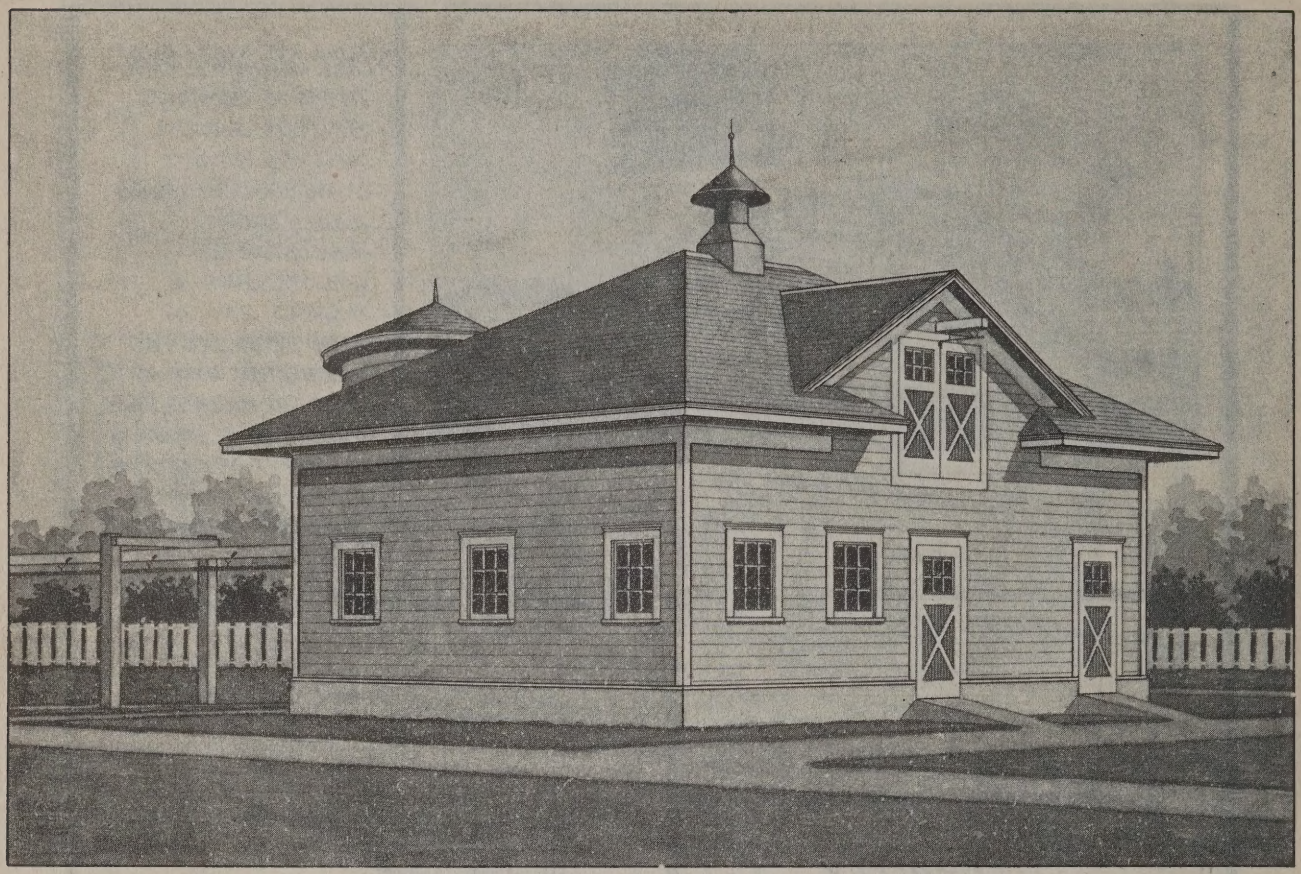
Design 4842

To get good results from your cows they must be kept comfortable and healthy. They need not be housed in an expensive building, but they must have plenty of sunlight and fresh air, and the utmost comfort it is possible to provide.

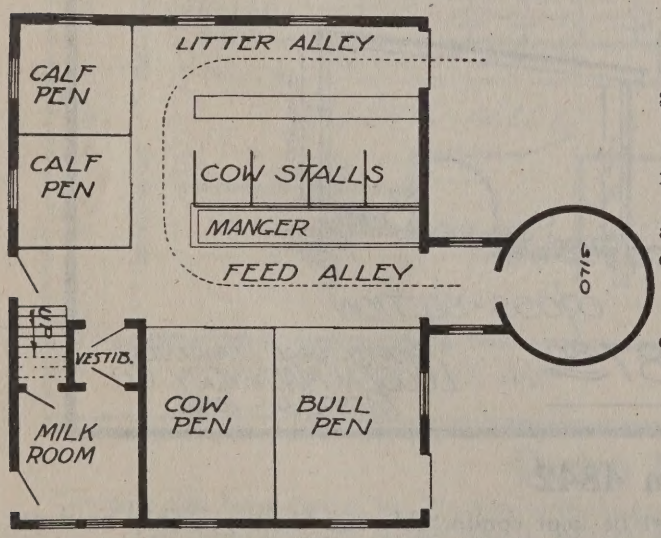
Design 4842 may be made any length, or may be added to.

This shed, when equipped with sanitary steel stalls, and with concrete floor, gutter, and manger, is just as convenient, healthful, and practical as a more pretentious building. The right kind of a start is the race half won.

Complete working plans and specifications, $4.00 per set.



Design 1844—For 5 Cows



Description

This barn is 26 ft. wide by 32 ft. long.

The foundation wall extends 18 inches above the ground, and the frame sidewalls are 12 ft. high.

The lower story is 9 ft. high, the hay mow is 11 ft. high from floor to ridge of roof. The ridge of roof is 22 ft. above the ground.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

Mow capacity, 9 tons loose hay.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $895.00.

Price of Complete working plans and specifications for Design 1844 ..... $5.00

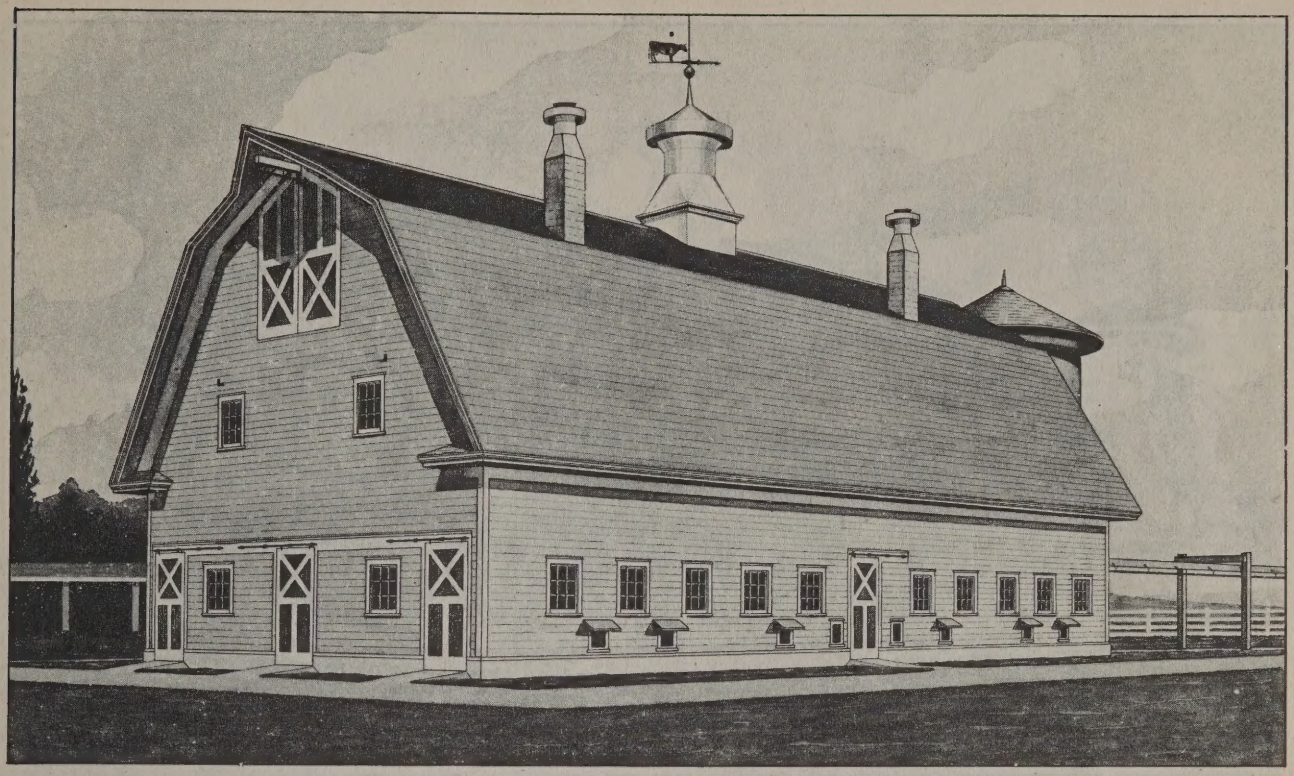
If your neighbor is going to build tell him about this book—and do both him and us a good turn.

Hershey, Pa.
May 15, 1914.

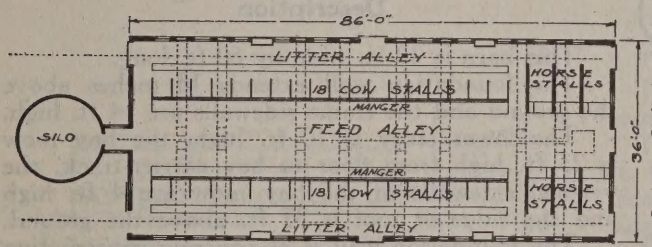
To Whom It May Concern:

As one of the Hershey Farm Managers I consider the Louden stalls and fixtures the best I have seen or tried. They are better made, simpler, and stronger than any barn equipment in the market that I have yet seen, and we have three different makes in use. I thoroughly recommend them.

F. B. Knavely,
Mgr. Hershey Farm Company.



Design 2559—For 36 Cows and 6 Horses



Description

This barn is 36 ft. wide by 86 ft. long.

The foundation wall extends 18 inches above the ground, and the frame sidewalls are 16 ft. high.

The lower story is 9½ ft. high, the hay mow is 23 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 6 ft. high, and the ridge of roof is 37 ft. above the ground.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

Mow capacity, 110 tons loose hay.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $2550.00.

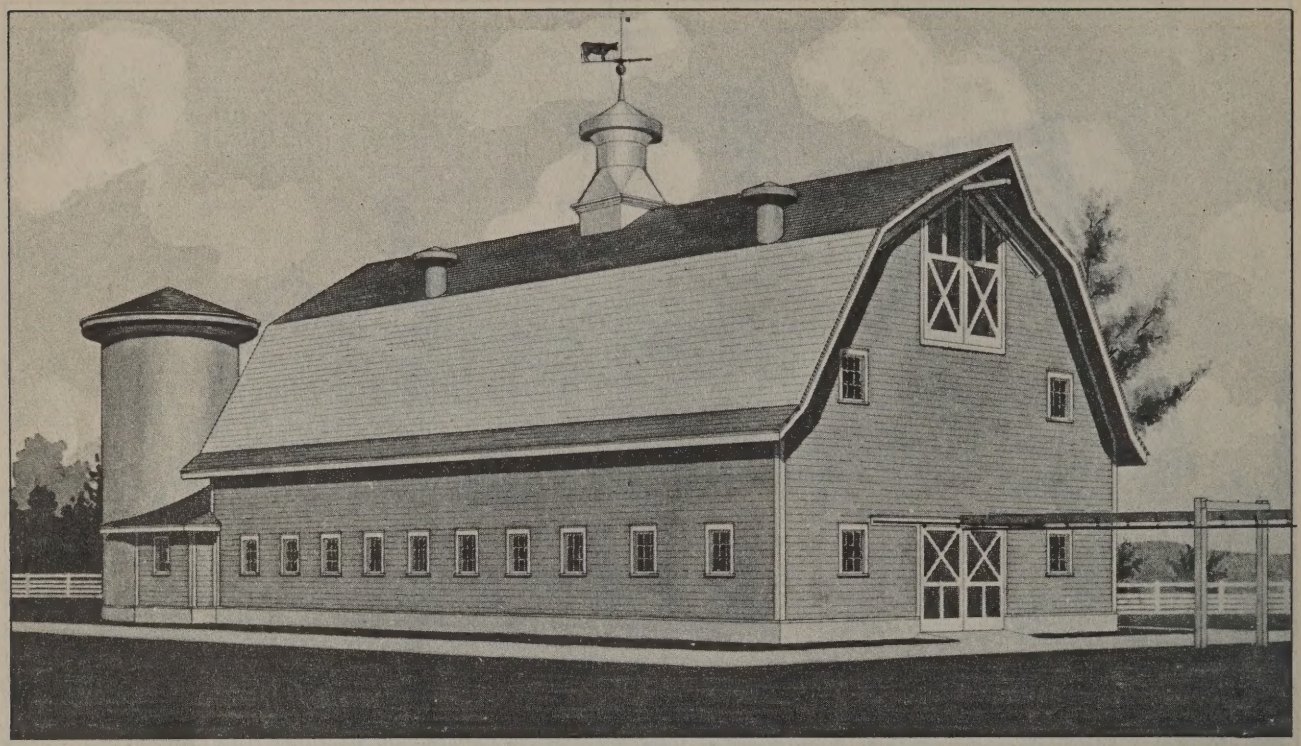
Price of Complete working plans and specifications for Design 2559 ..... $5.00

In a warm stable we can coax a baby beef to weigh a thousand pounds before it is a year old.

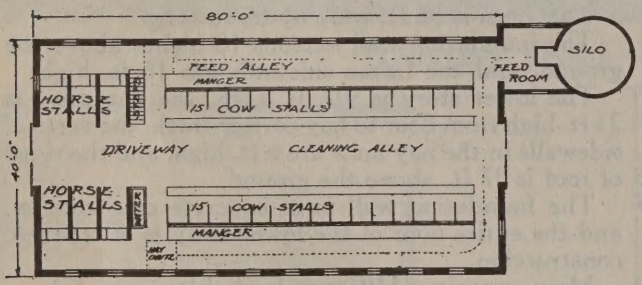
A farm with poor buildings is at the mercy and caprice of speculators. Grain must be threshed and marketed, regardless of the season.

Before the time of good farm buildings, grain sold for little money and a great deal of it was wasted between the field and the cash returns. Increase in the value of live stock has changed the whole farming business. When corn is cheap, instead of feeding it into a heating stove, farmers feed it to cattle and hogs. A good live-stock farm is a busy place. It furnishes something of interest every hour of the day. The live-stock population on a well-managed farm increases each year. The increase demands greater accommodation, so that we must repair the old buildings and we must build new ones.

This is just the same as manufacturing in other lines; no man can remain stationary, and prosper. Factories of all kinds must throw out good machinery that is little the worse for wear, because new processes have been invented and the manufacturer is obliged to keep up with the times. The farmer is no exception.



Design 1943—For 30 Cows and 6 Horses



Price of Complete working plans and specifications for Design 1943 $5.00

Description

This barn is 40 ft. wide by 80 ft. long.

The foundation wall extends 18 inches above the ground and the frame sidewalls are 14 ft. high.

The lower story is 10 ft. high, the hay mow is 23 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 4 ft. high and the ridge of roof is 37 ft. above the ground.

The foundation wall is of concrete construction and the entire floor of the lower story is of concrete construction.

Mow capacity, 96 tons loose hay.

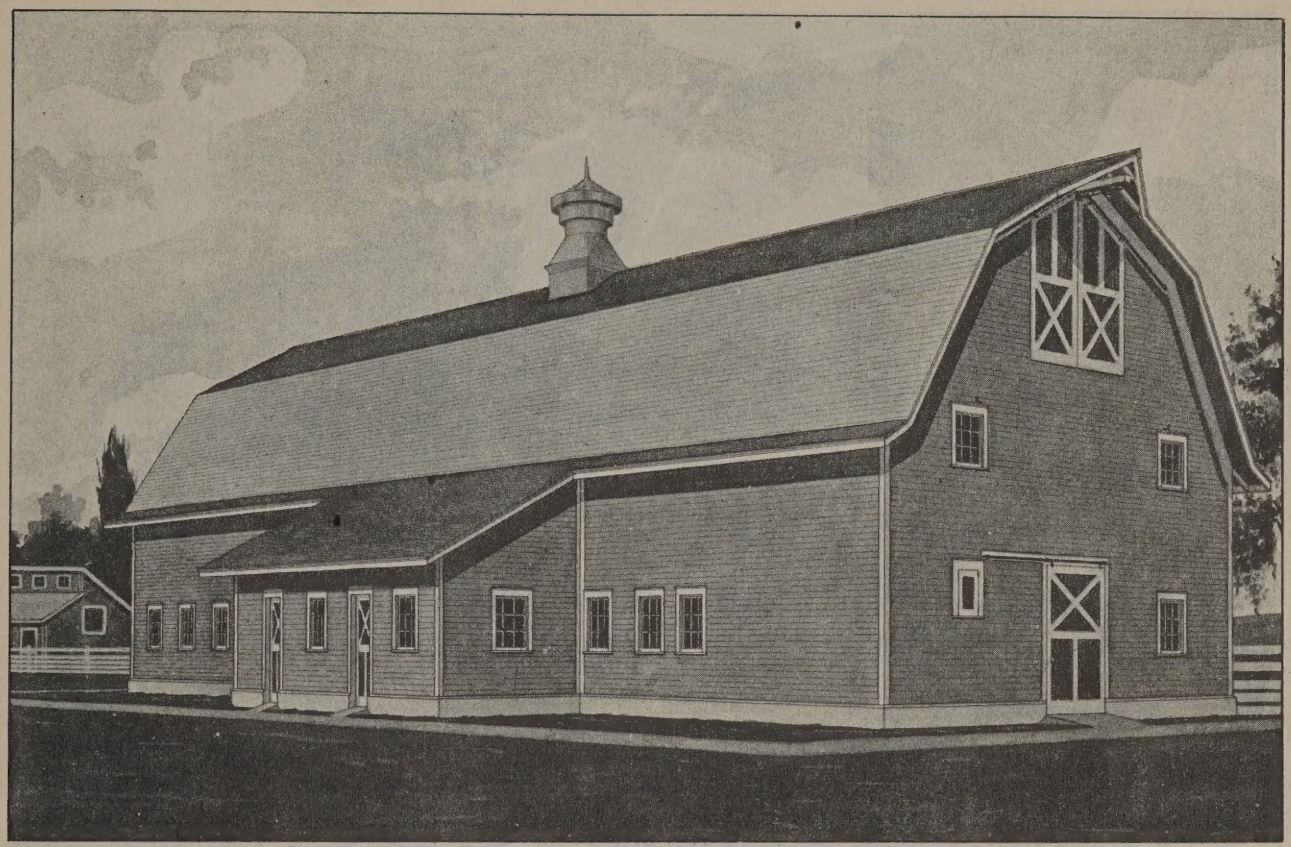
The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $3000.00.

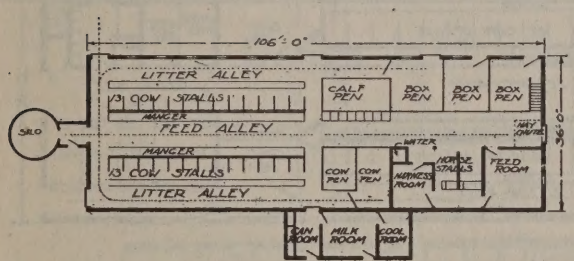
It would be rather difficult for me to tell you exactly when I first purchased Louden goods. It has been many years.

The latest considerable bill of goods from you have been in use since 1910 and like all others which I have in use, bought from you at various times, are giving good satisfaction. Will be in the market again soon: and to me modern barn fixtures are synonymous with Louden.

W. M. Black,
Makwell, Iowa



Design 1853—For 26 Cows, 2 Horses and Young Stock



Description

This barn is 36 ft. wide by 106 ft. long.

The foundation wall extends 18 inches above the ground and the frame sidewalls are 16 ft. high.

The lower story is 9 ft. high, the hay mow is 23 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 6 ft. high, and the ridge of roof is 37 ft. above the ground.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

Mow capacity, 128 tons loose hay.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $3650.00.

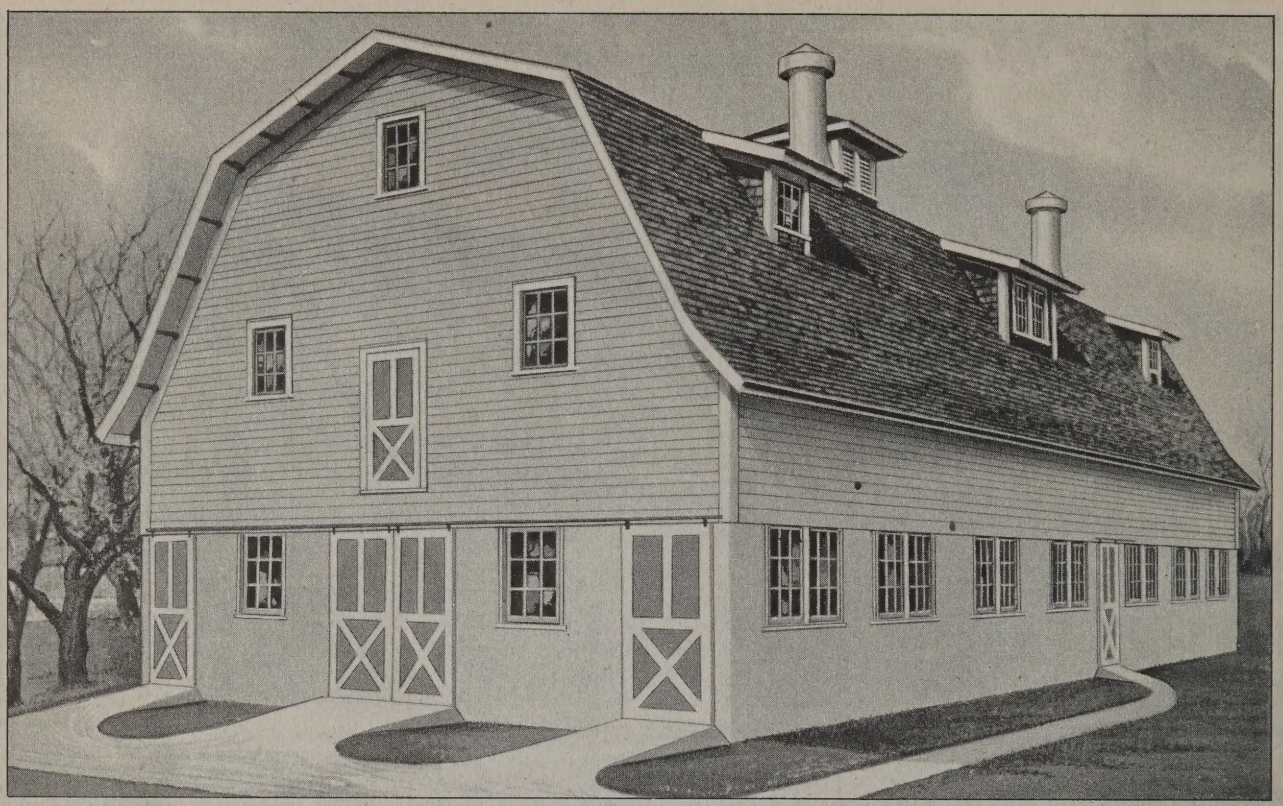
The development of tubular and structural steel has made possible the construction and perfection of modern steel barn equipments at a moderate cost, and the wide-awake dairyman should take advantage of this modern equipment and thereby increase his capacity and profits.

Price of Complete working plans and specifications for Design 1853 ..... $5.00

Louden Machinery Company,

Gentlemen: In regard to the serviceability of stalls and stanchions purchased from you, we beg to say same have given perfect satisfaction and are all you claimed for them. Truly yours,

Henry W. Rothert, Supt., Iowa School for the Deaf, Council Bluffs, Iowa



Exterior View of Barn Planned for Mr. C. C. Sedgwich, Sioux City, Iowa

Description

This barn is 36 ft. wide by 86 ft. long.

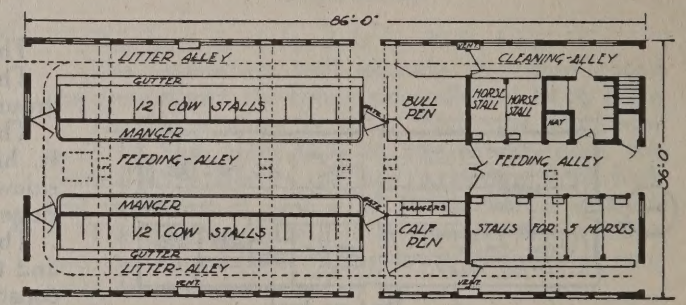
The basement wall extends 9½ ft. above the ground, and the frame sidewalls are 7 ft. high.

The lower story is 9 ft. high, the hay mow is 20 ft. high from floor to hay carrier-track. The ridge of roof is 33 ft. above the ground.

The basement wall is of concrete construction, and the entire floor of the lower story is of concrete construction. Roof is covered with shingles.

Mow capacity, 90 tons loose hay.

The barn above the basement is of plank-frame construction and has a clear hay mow without posts.



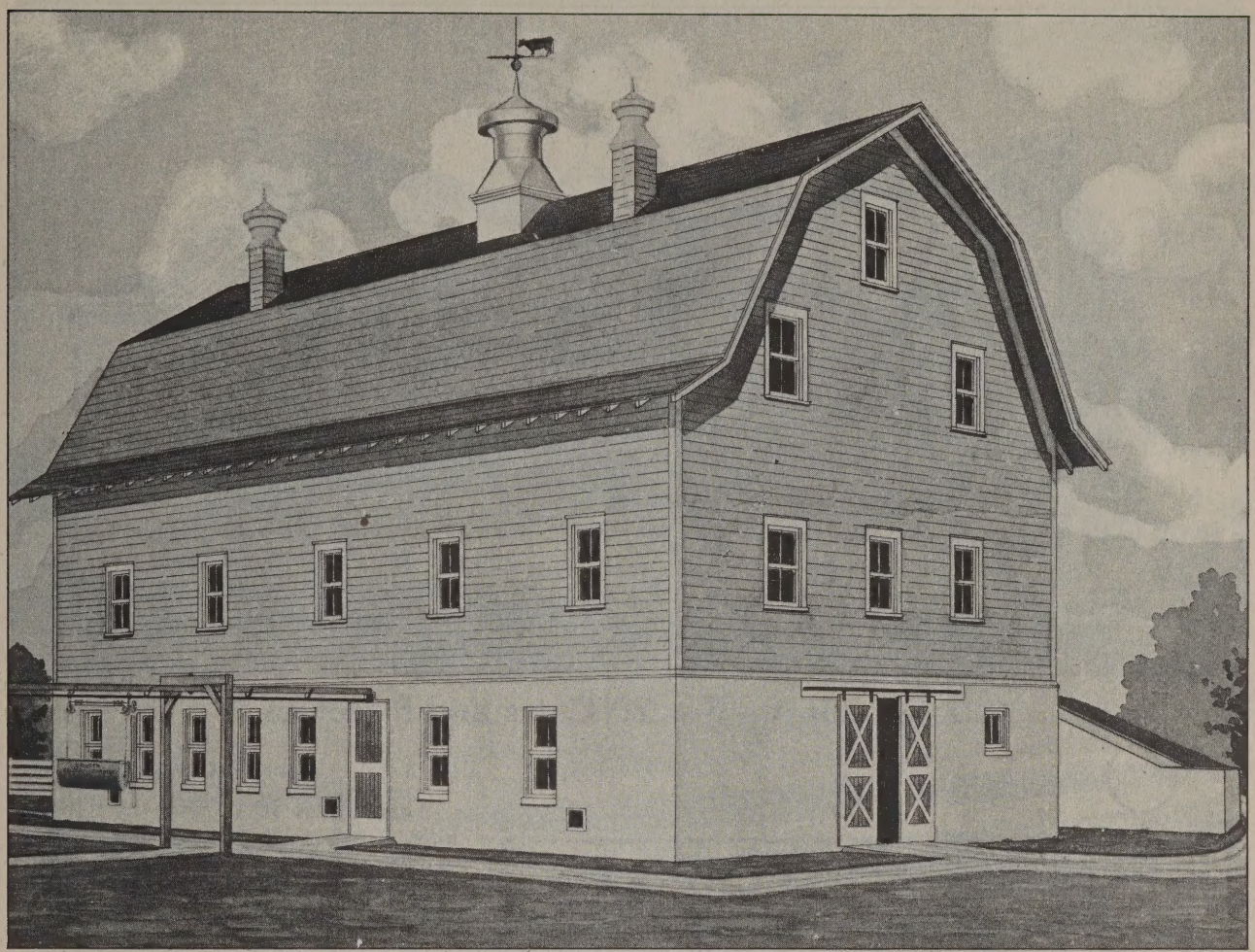
Design 4368

For 24 Cows and 7 Horses

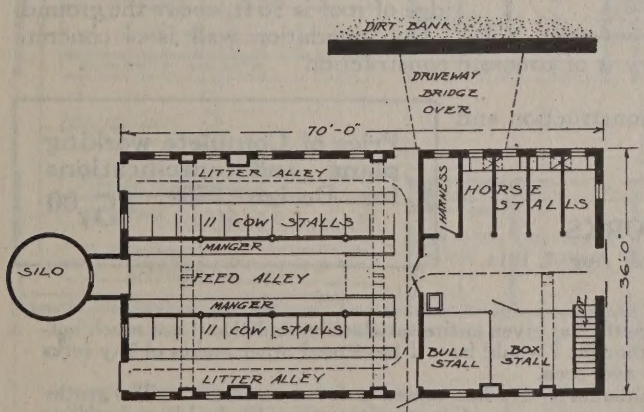
Louden Machinery Company,
Gentlemen:
The Hay Fork I purchased of you is a dandy; used it in clover chaff; handled it fine.

J. H. Maurer, Marshall, Ill.

Price of Complete working plans and specifications for Design 4368. $10.00



Design 2487—For 22 Cows and 5 Horses



Description

This barn is 36 ft. wide by 70 ft. long.

The foundation wall extends 10 ft. above the ground and the frame sidewalls are 16 ft. high.

The lower story is 10 ft. high, the hay mow is 31 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 15 ft. high, and the ridge of roof is 46 ft. above the ground.

The basement wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

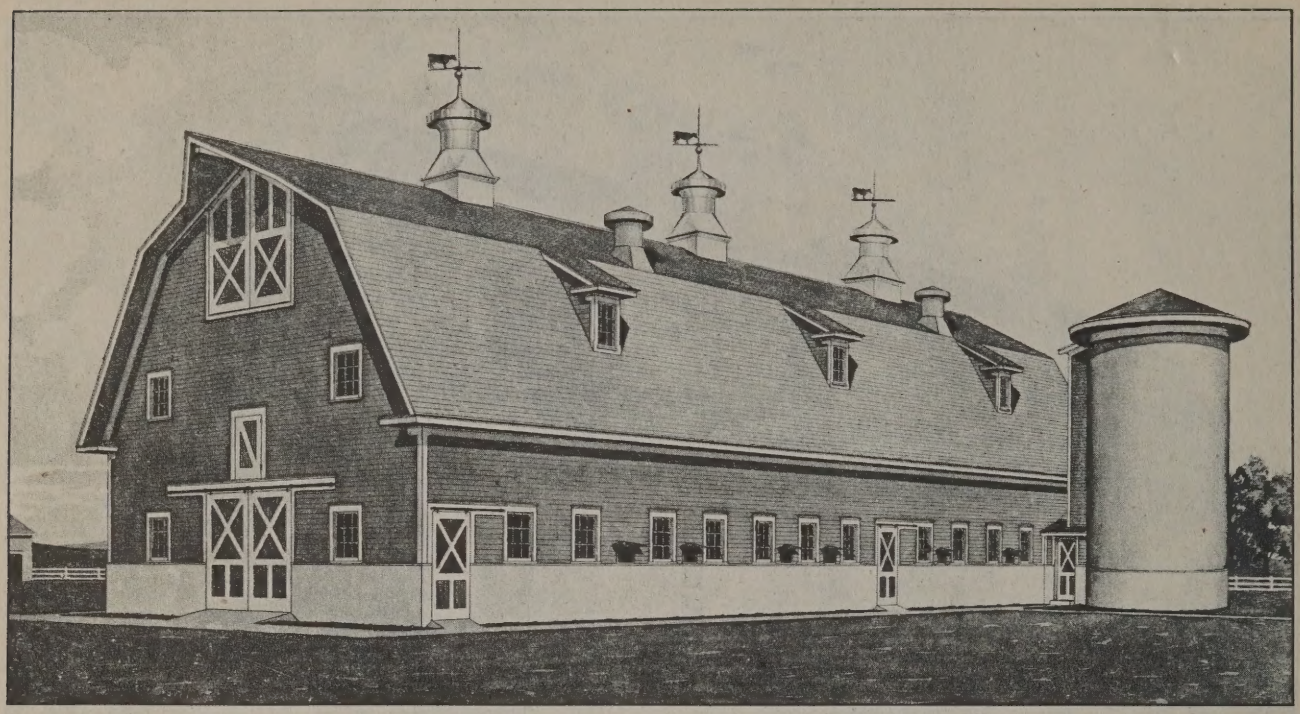
Mow capacity, 95 tons loose hay.

The barn above the basement is of plank-frame construction and has a clear hay mow without posts.

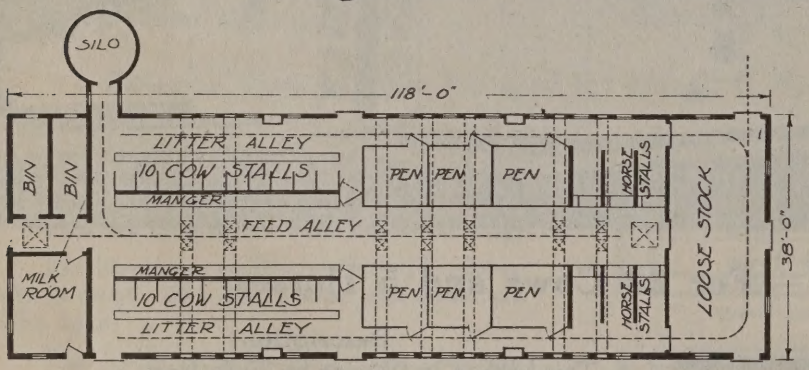
The cost is estimated to be $4200.00

Louden Machinery Co.,
Gentlemen: One of your Litter Carrier outfits has been in use in my barn now for about two years and has proven perfectly satisfactory in every way. I can highly recommend them to any one.
Yours very truly, W. W. Jennings, Prop.,
Jenningshurst Stock Farm, Towanda, Pa.

Price of Complete working plans and specifications for Design 2487 ..... $5.00



Design 2569—For 20 Cows and 6 Horses



Description

This barn is 38 ft. wide by 118 ft. long.

The foundation wall extends 4 ft. above the ground and the frame sidewalls are 12 ft. high.

The lower story is 9 ft. high, the hay mow is 24 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 5 ft. high, and the ridge of roof is 36 ft. above the ground.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

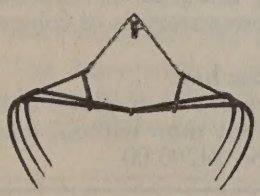
Mow capacity, 150 tons loose hay.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $3800.00.

Price of Complete working plans and specifications for Design 2569 ..... $5.00

AN OPINION ON LOUDEN HAY FORKS



Apison, Tenn. Aug. 1, 1914

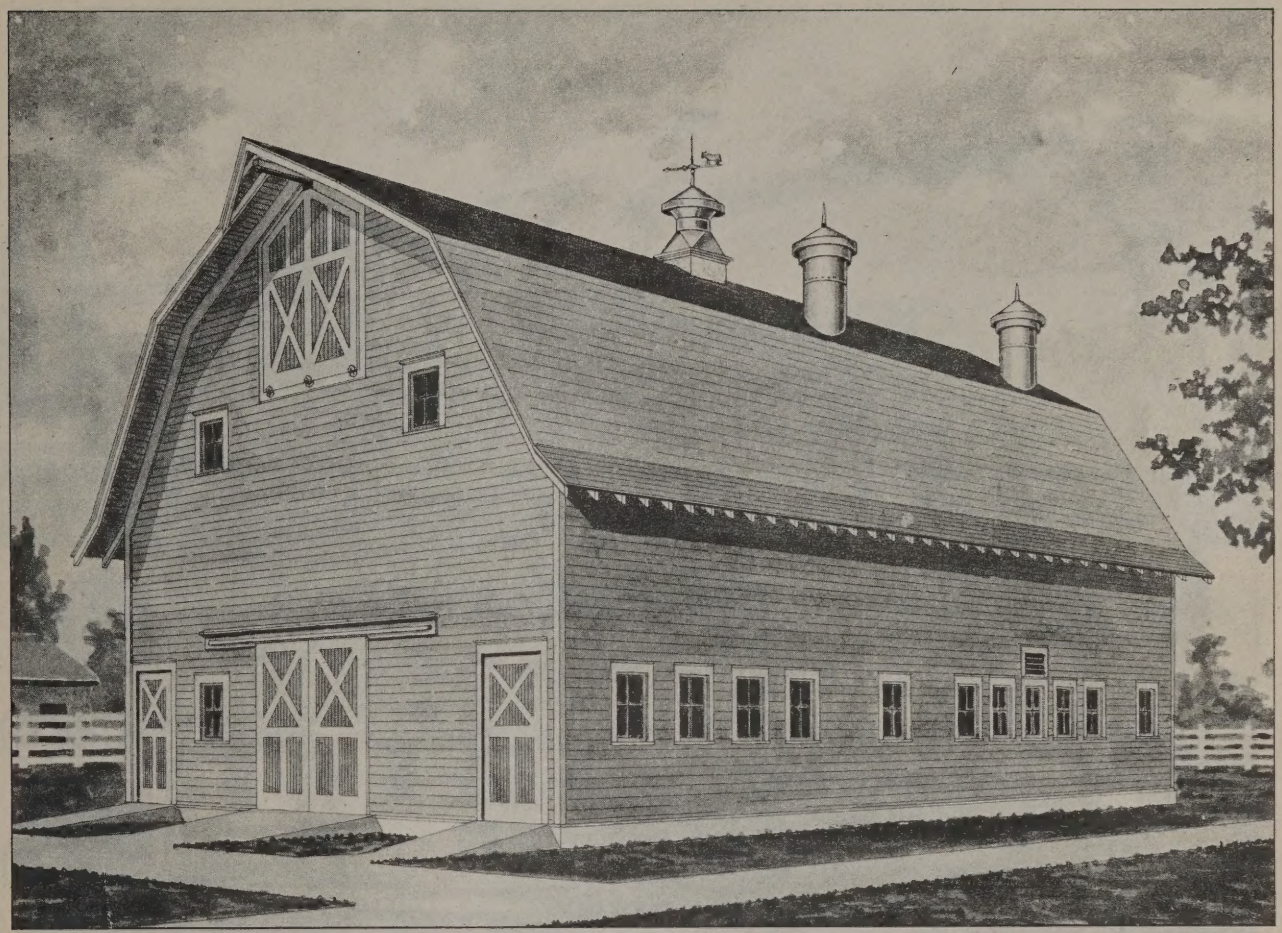
Louden Machinery Company,
Gentlemen:

I beg leave to say that the outfit has given entire satisfaction and that I am much better pleased with it than I had thought I would be. I have used other makes of hay forks but this is the best that I have ever seen.

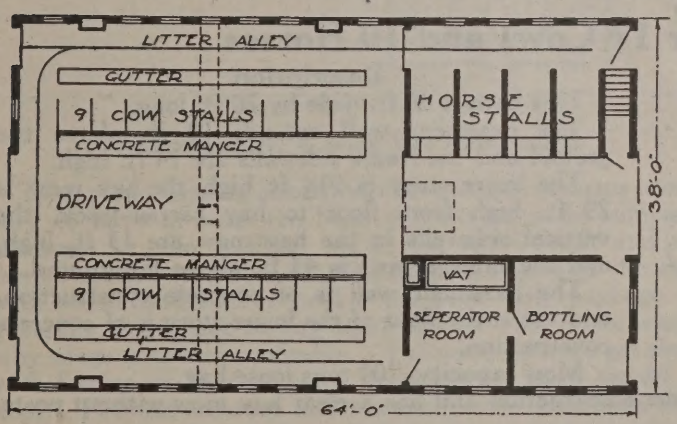
It is the only fork in the community and has caused a lot of comment. The gentleman from whom I bought the farm came around to see it work. He had been handling over a hundred acres of hay every year with the back-breaking pitch-fork method, and when he saw the fork work and the ease with which I filled my mow, he said, "That thing works like it had good sense." I told him that the man who made it had a good supply.

I shall always be ready to demonstrate the outfit to any of my neighbors, for I feel that it is the best hired man that a farmer can get. Thanking you for all favors, I am Yours very truly,

(Signed) J. L. Hinshaw



Design 2162—For 18 Cows and 4 Horses



Price of Complete working plans and specifications for Design 2162 ..... $5.00

Description

This barn is 38 feet wide by 64 feet long. The side walls are 16 feet high and the top of the roof is 36 feet above the ground.

The lower story is 11 feet high and the hay fork track in the upper story hangs 23 feet above the mow floor.

Mow capacity, 80 tons loose hay.

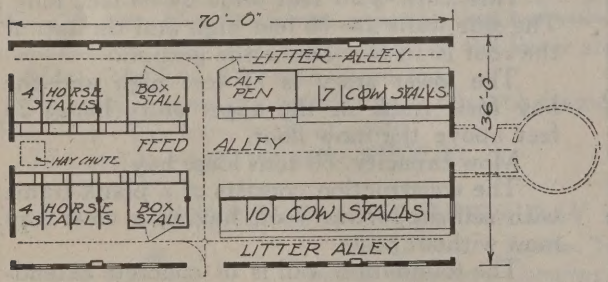
The construction consists of a plank-frame with self-supporting roof, having a clear hay mow without posts.

The foundation wall is of concrete extending above dampness from ground and lower floor is of cement with cement mangers and gutters. Cow stalls are of tubular steel and horse stalls of plank construction.

This barn contains 18 cow stalls, four horse stalls, separator room and bottling room and has a 10-ft. clear driveway through the middle.

The cost is estimated to be $2150.00.

Design 2566B — For 17 Cows and 10 Horses



Description

This barn is 36 ft. wide by 70 ft. long.

The basement wall extends 10 ft. above the ground and the frame sidewalls are 14 ft. high.

The lower story is 9½ ft. high, the hay mow is 29 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 13 ft. high, and the ridge of roof is 43 ft. above the ground.

The basement wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

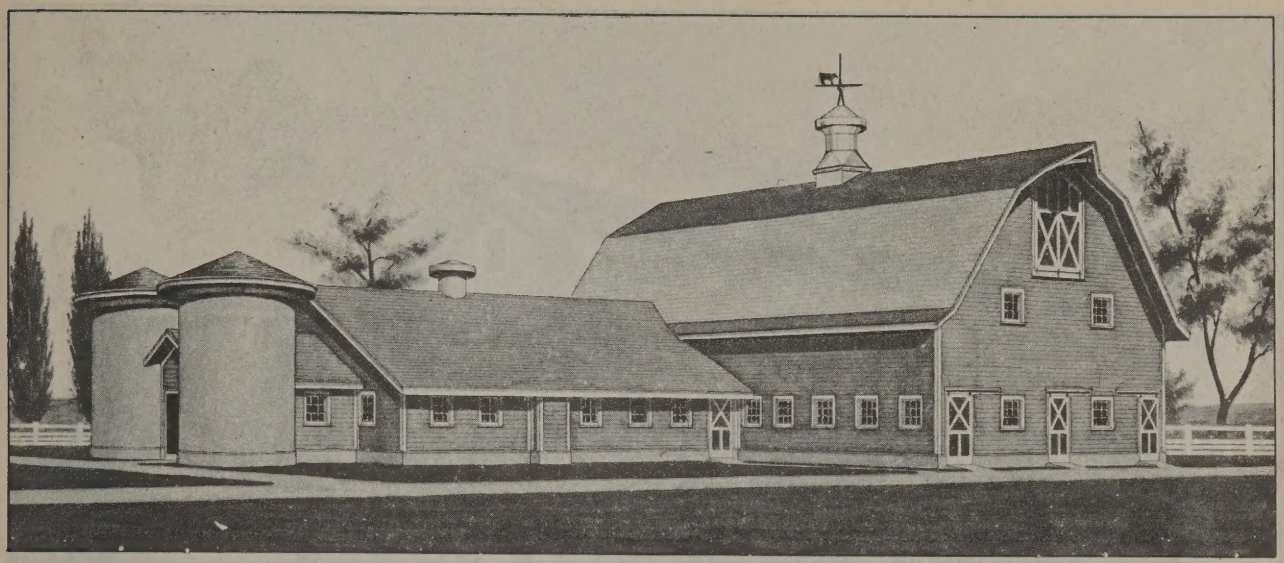
Mow capacity, 100 tons loose hay.

The barn above the basement is of plank-frame construction and has a clear hay mow without posts. The cost is estimated to be $2950.00.

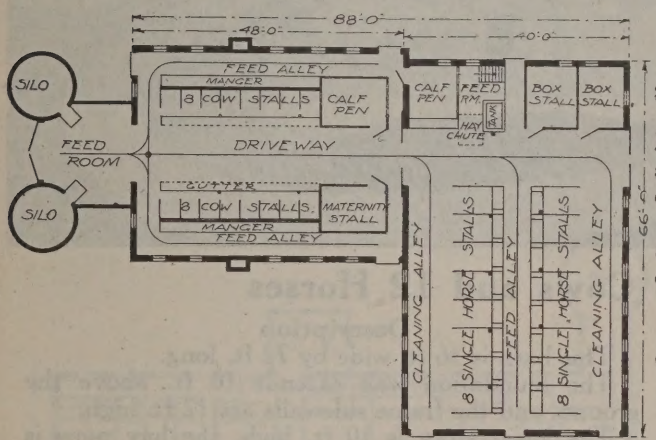
Painesville, Ohio, July 22, 1913.

Louden Machinery Company,
Gentlemen:
The carriers are O. K. Have saved their cost already.
Yours truly,
L. M. Johnson, Mgr.,
"Old Orchard" Farm, Jersey Cattle.

Price of Complete working plans and specifications for Design 2566B **$5.00**



Design 2026—For 16 Cows and 18 Horses



Description

This barn is 66 ft. wide by 88 ft. long.

The foundation wall extends 18 inches above the ground, and the frame sidewalls are 14 ft. high.

The lower story is 10 ft. high, the hay mow is 22 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 4 ft. high, and the ridge of roof is 36 ft. above the ground

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

Mow capacity, 80 tons loose hay.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $3260.00.

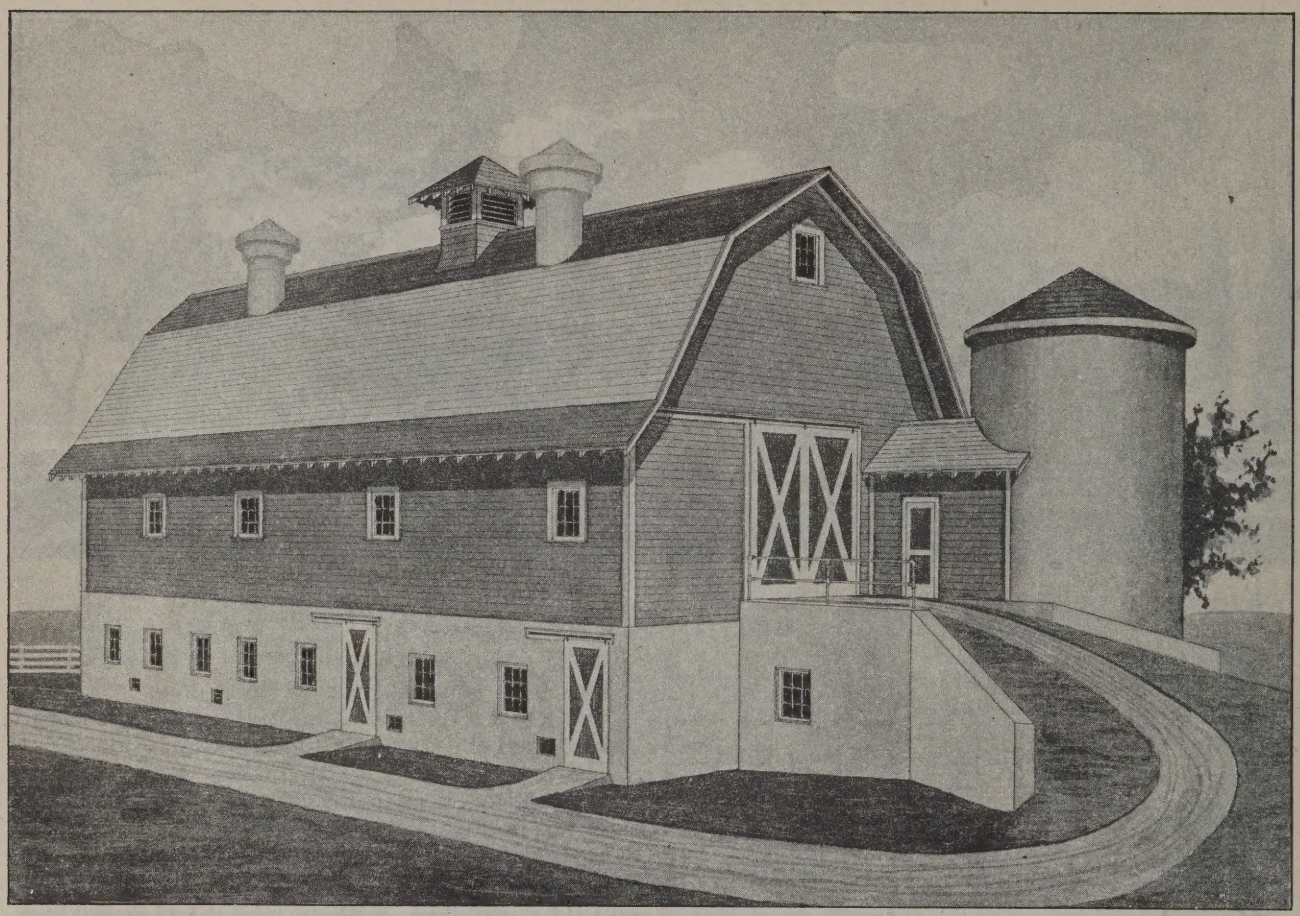
Price of Complete working plans and specifications for Design 2026 ..... $6.00

Number of Cows for One Silo

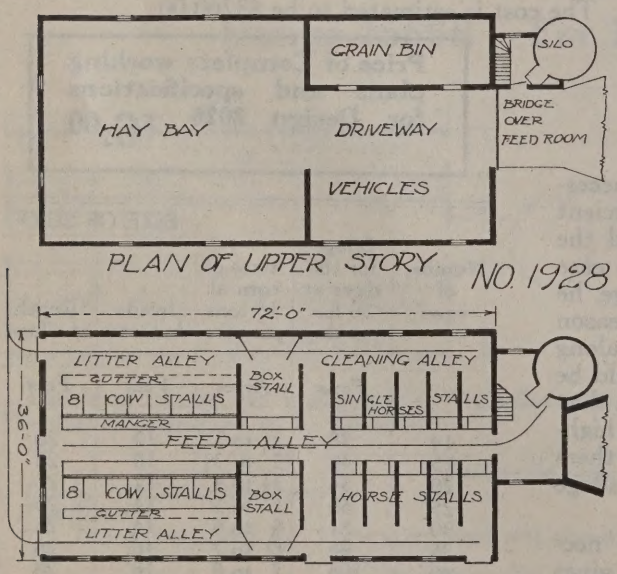
Taking one farming condition with another, it seems necessary to have at least ten head of cows to make sufficient business for silo feeding. After the silo is built and the farmer realizes its value for feeding purposes, and the ease with which the farm live stock is provided with roughage, he generally starts out to buy more cows. This is one reason why silage is so very profitable. Too many farmers get along with five or six head of cows, when twenty head should be kept. Farmers are wary about keeping more stock than they can feed. Most farmers have had experiences in buying high-priced feed to carry them through the winter; it makes them careful. It requires about one month's feeding with silage to appreciate its possibilities.

The following table gives the amount of silage necessary for different sized herds of cattle. It also gives the amounts to feed daily together with the acreage of land necessary to grow the corn to fill it.

Number of cows	Silage for 180 days at 30 lbs. per day	Acres of corn at 15 tons per acre	SIZE OF SILO	
			Inside diameter	Depth of silage
	Tons	Acres	Feet	Feet
14	38	2 to 3	10	26
15	40	3 to 3½	10	28
20	54	3½ to 4	12	26
25	68	4 to 5	14	26
30	81	5 to 6	14	28
35	95	6 to 7	16	26
40	108	7 to 8	16	28
45	122	8 to 9	18	26
50	136	9 to 10	20	26



Design 1928—For 16 Cows and 12 Horses



Plan of lower story.

Description

This barn is 36 ft. wide by 72 ft. long.

The foundation wall extends 10 ft. above the ground, and the frame sidewalls are 12 ft. high.

The lower story is 10 ft. high, the hay mow is 28 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 12 ft. high, and the ridge of roof is 42 ft. above the ground.

The basement wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

Mow capacity, 70 tons loose hay.

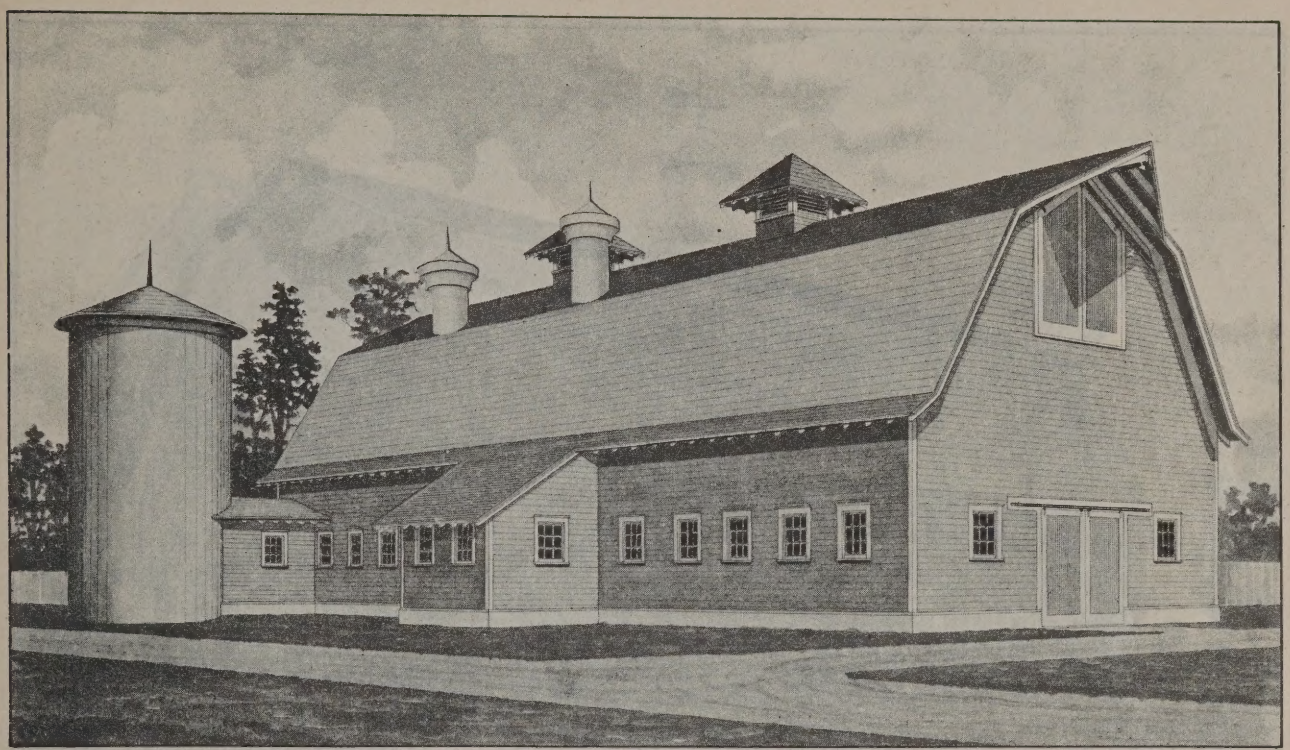
The barn above the basement is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $2850.00.

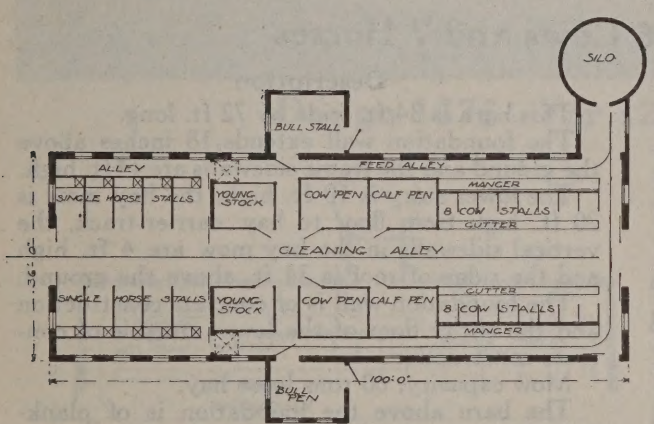
Price of Complete working plans and specifications for Design 1928 ..... $6.00

Cubic Inches

There are 2,150.42 cubic inches in a bushel. The number of cubic inches in a gallon is 231.



Design 1984—For 18 Cows and 10 Horses



Covering Capacity of Shingles

Average size of shingles—4 x 16 inches—is taken as a basis of calculation.

100 sq. ft. will require, laid 4 inches to the weather 900

100 sq. ft. will require, laid 4½ inches to the weather 800

100 sq. ft. will require, laid 5 inches to the weather 720

Three and one-half pounds of four-penny nails are required for laying 1,000 shingles.

5 to 10 per cent should be added to these figures for waste and shortage.

Description

This barn is 36 ft. wide by 100 ft. long.

The foundation wall extends 18 inches above the ground and the frame sidewalls are 14 ft. high.

The lower story is 10 ft. high, the hay mow is 22 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 4 ft. high and the ridge of roof is 36 ft. above the ground.

Mow capacity, 100 tons loose hay.

The foundation wall is of concrete construction and the entire floor of the lower story is of concrete construction.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $3,800.00.

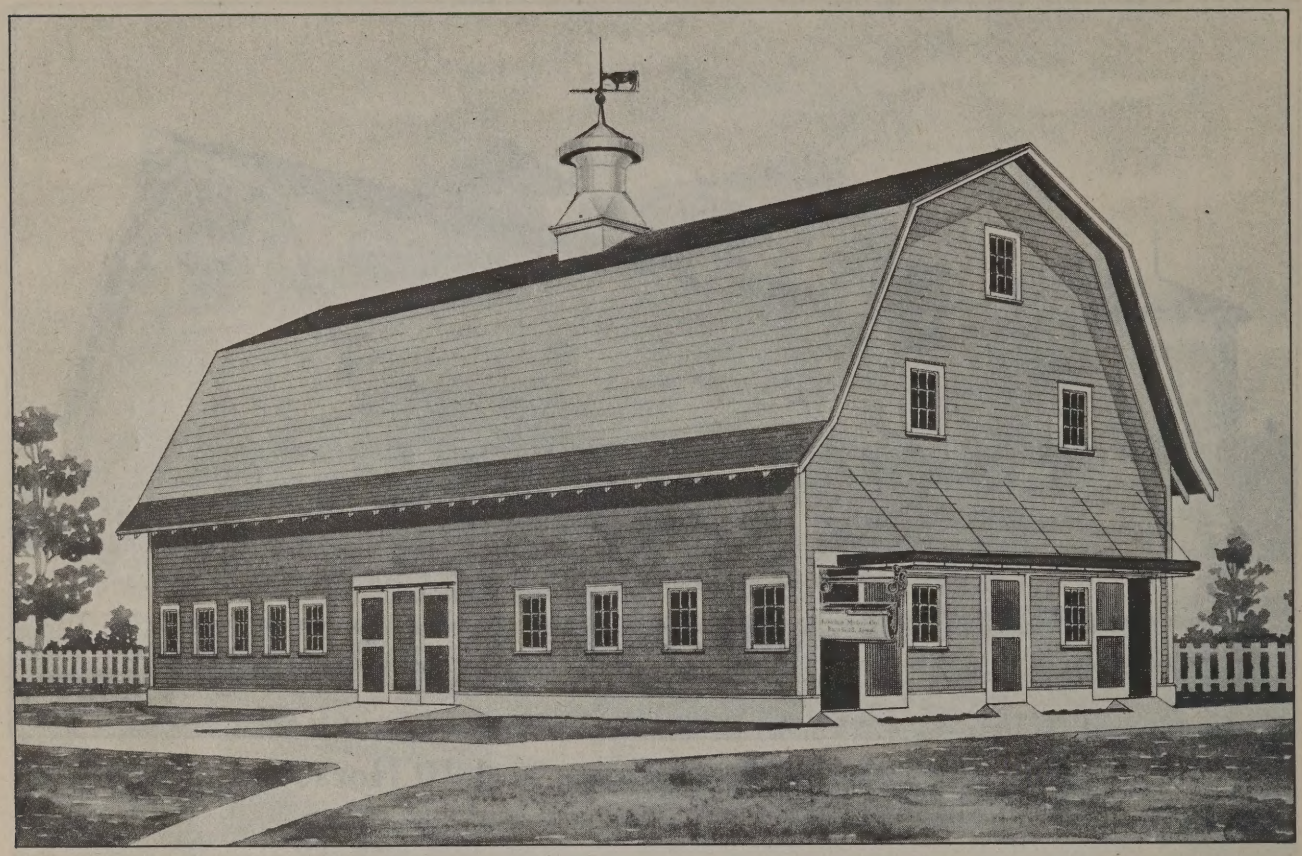
Price of Complete working plans and specifications for Design 1984 . . . . . $5.00

Dear Sirs;

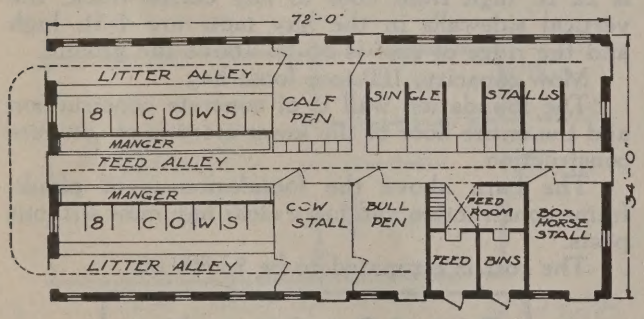
I made my first purchase of Louden goods six years ago. I am very much pleased with them. Have never seen anything their equal.

Yours respectfully,

C. B. Eastman, Belleville, N. Y.



Design 1757—For 16 Cows and 7 Horses



Description

This barn is 34 ft. wide by 72 ft. long.

The foundation wall extends 18 inches above the ground and the frame sidewalls are 14 ft. high.

The lower story is 10 ft. high, the hay mow is 20 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 4 ft. high and the ridge of roof is 34 ft. above the ground.

The foundation wall is of concrete construction and the entire floor of the lower story is of concrete construction.

Mow capacity, 60 tons loose hay.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $2500.00.

This makes a very compact barn and each foot of space is put to good use.

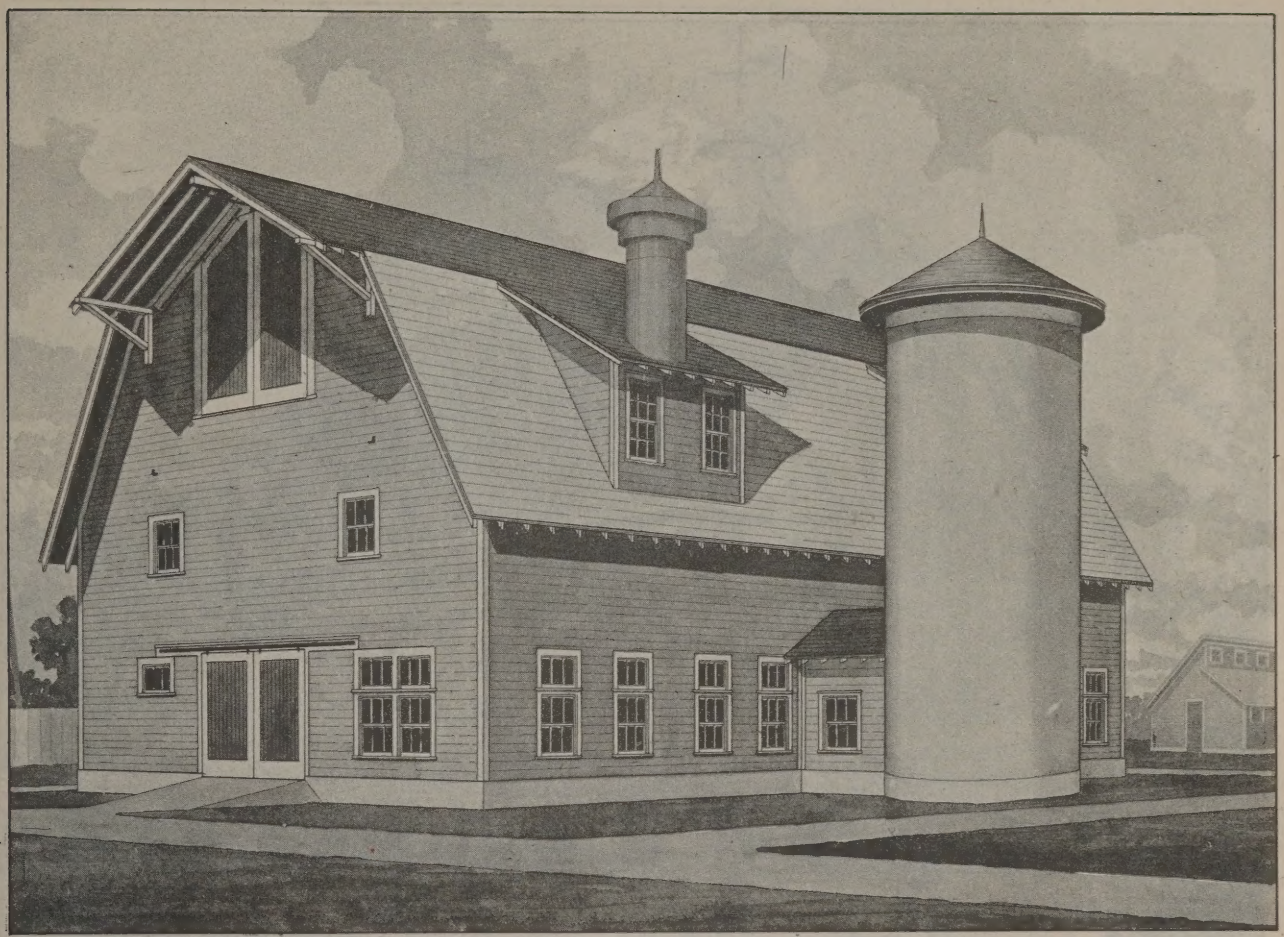
The location of the feeding room is convenient to the horses and the cows can be fed from a silo located at one end of the barn if desired.

The hay chute is built inside of the feed room and enclosed to keep the dust out of the stable.

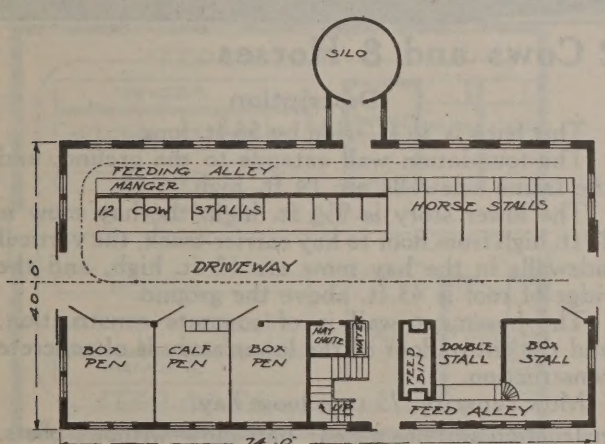
The bins can be filled from the outside and if desired, can be extended up into the second story.

The exterior view shows the end at left hand end of the plan and illustrates how the litter carrier can be run on a suspended track so the manure spreader can be placed under this track and the carrier dumped direct into spreader.

Price of Complete working plans and specifications for Design 1757 ..... $5.00



Design 1676—For 12 Cows and 8 Horses



Description

This barn is 40 ft. wide by 74 ft. long.

The foundation wall extends 14 inches above the ground, and the frame sidewalls are 16 ft. high.

The lower story is 9½ ft. high, the hay mow is 27 ft. high from floor to hay carrier-track.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

Mow capacity, 85 tons loose hay.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The hay mow has storage room for 125 tons of loose hay and also has bins for grain.

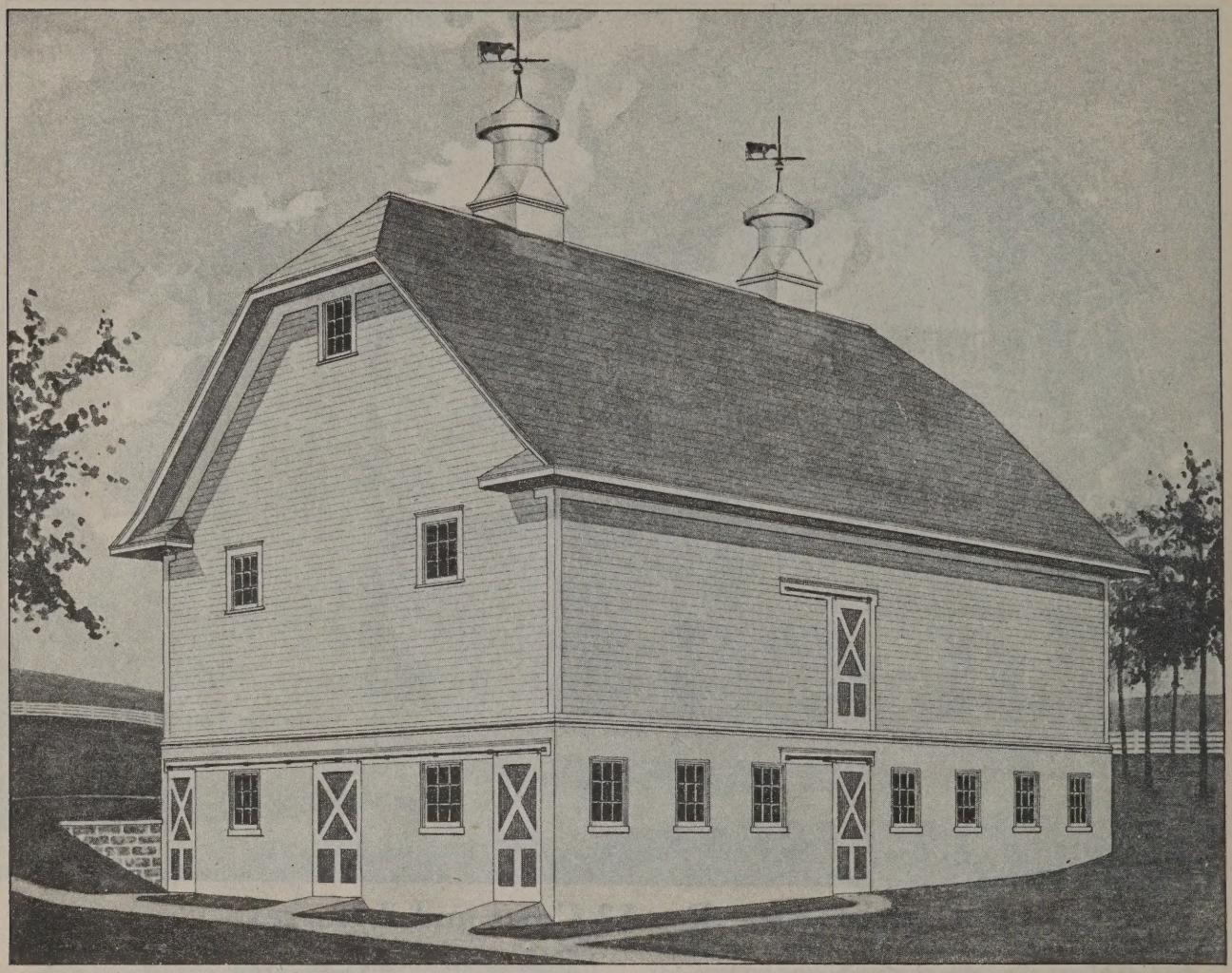
The cost is estimated to be $2800.00.

Pine Nob Farm, Lakeside Station, Spokane Co., Wn.
Spokane Seed Company, Spokane, Washington. April 21, 1913.

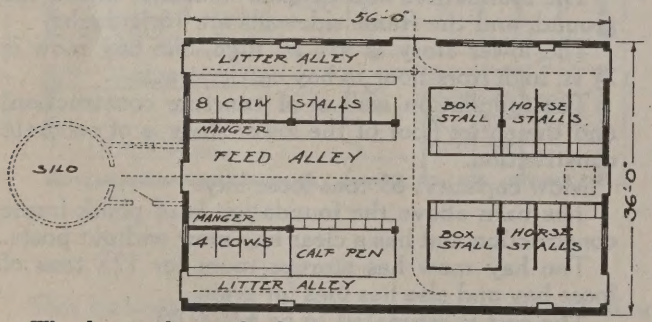
Gentlemen: The Louden Stalls and Stanchions purchased of you several months ago for our dairy barn have given perfect satisfaction, and we have no hesitancy in commending them. They are not only strong and convenient, but are so shaped and adjusted as to admit of full comfort to this very worthy "Step-mother" to the human family.

Very truly yours, Pine Nob Farm, Leo Walton, Mgr.

Price of Complete working plans and specifications for Design 1676 $5.00



Design 2566A—For 12 Cows and 8 Horses



Description

This barn is 36 ft. wide by 56 ft. long.

The foundation wall extends to the ground, and the frame sidewalls are 14 ft. high.

The lower story is 9½ ft. high, the hay mow is 26 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 13 ft. high, and the ridge of roof is 43 ft. above the ground.

The basement wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

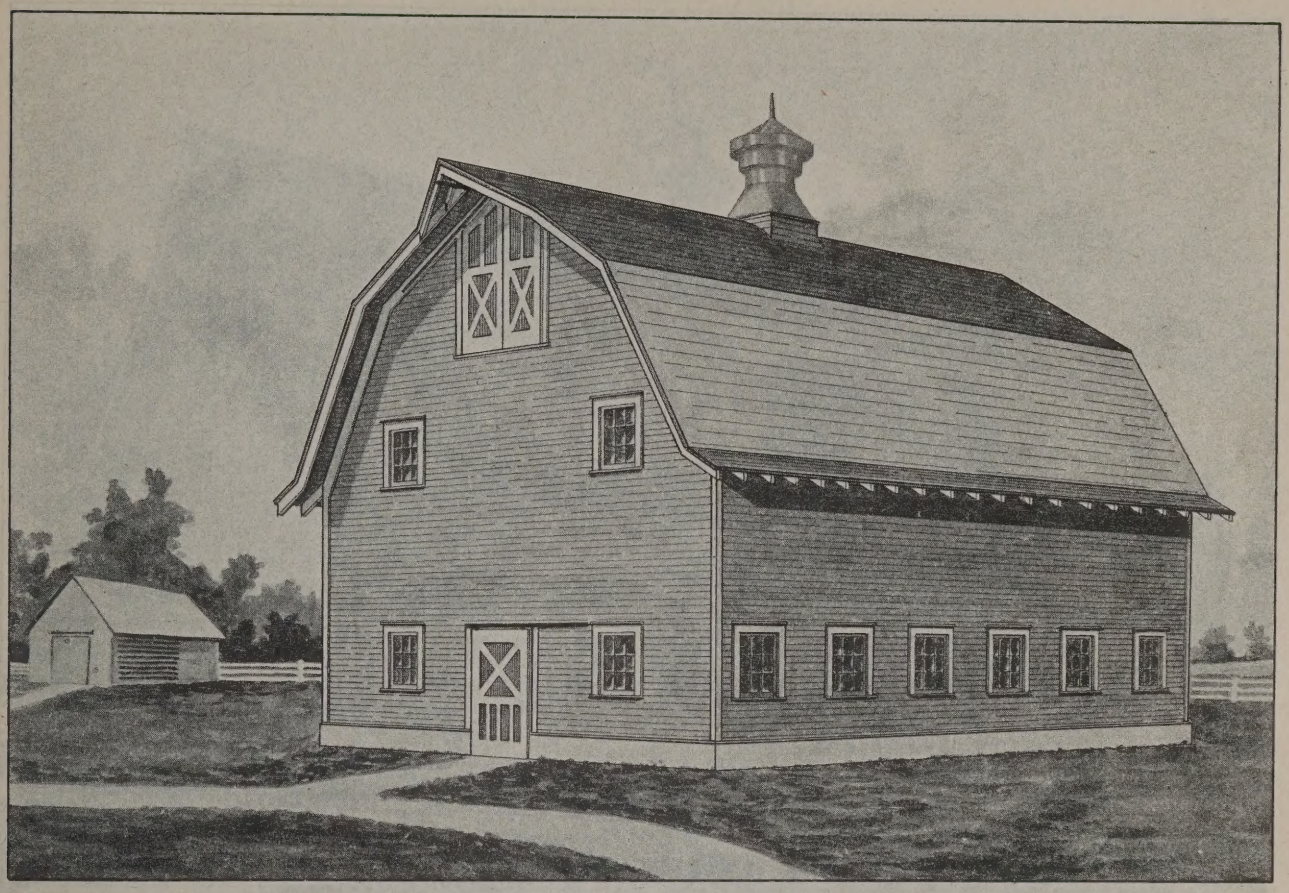
Mow capacity, 75 tons loose hay.

The barn above the lower story is of plank-frame construction and has a clear hay mow without posts. The cost is estimated to be $2260.00.

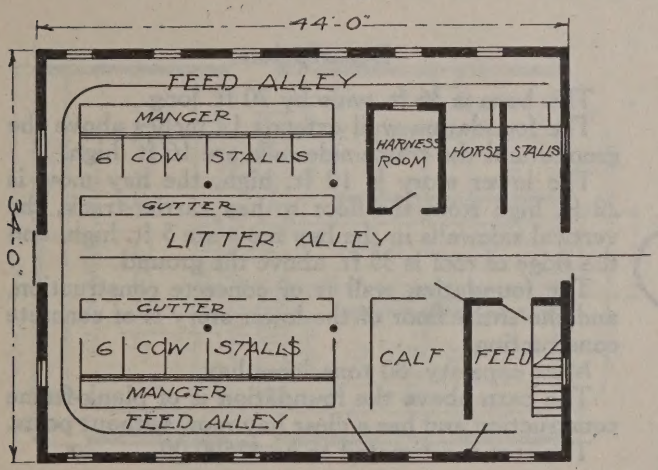
Louden Machinery Company,
Dear Sirs:
Your stall equipment and litter carrier have been in service at our Lucas Avenue Dairy Farm at Kingston, N. Y., for a year and has given entire satisfaction.

Yours truly, C. R. Knapp, Albany, N. Y.

Price of Complete working plans and specifications for Design 2566A **$5.00**



Design 1788—For 12 Cows and 2 Horses



Description

This barn is 34 ft. wide by 44 ft. long.

The foundation wall extends 18 inches above the ground and the frame sidewalls are 14 ft. high.

The lower story is 9 ft. high, the hay mow is 21 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 6 ft. high and the ridge of roof is 33 ft. above the ground.

The foundation wall is of concrete construction and the entire floor of the lower story is of concrete construction.

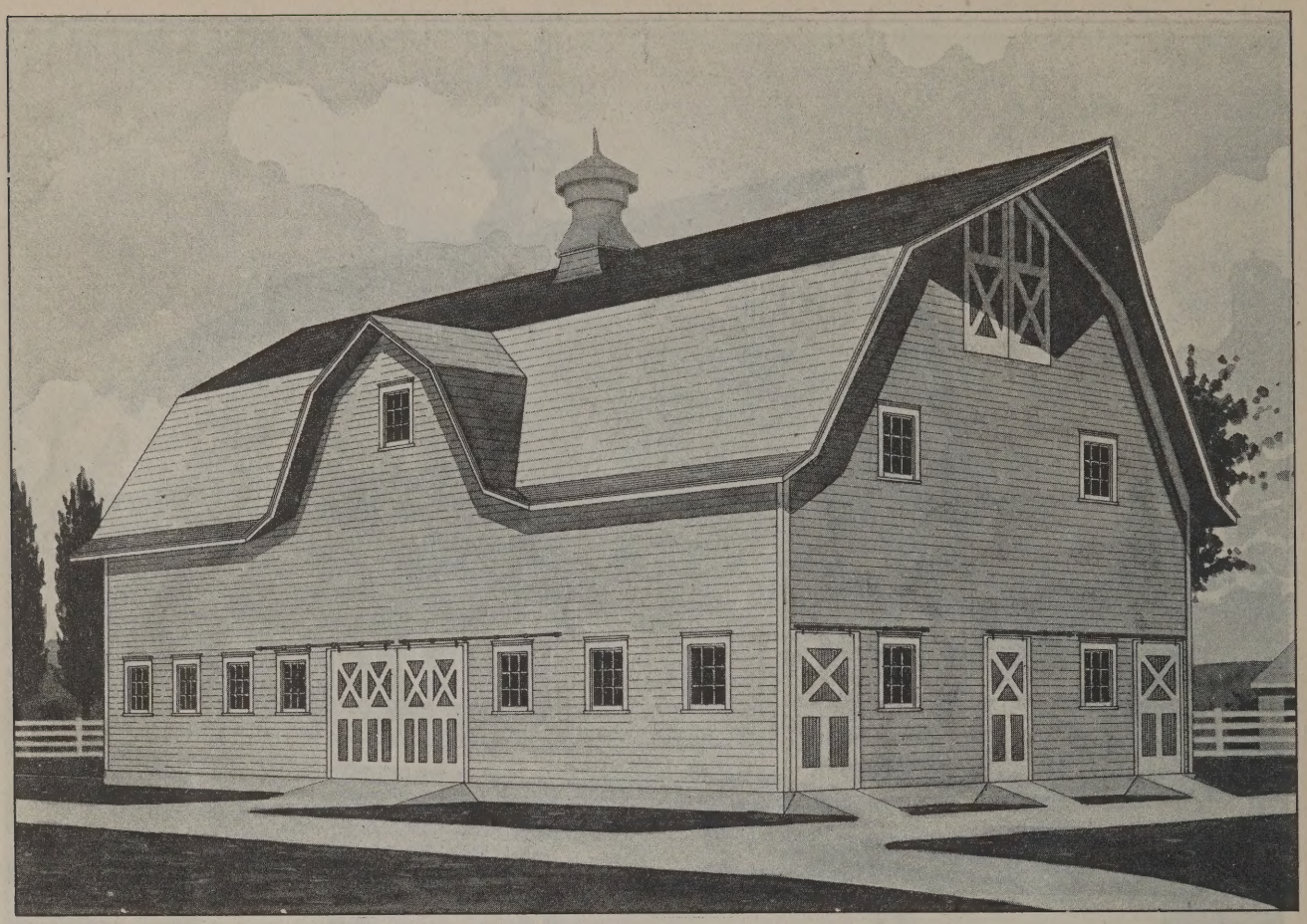
Mow capacity, 40 tons loose hay.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

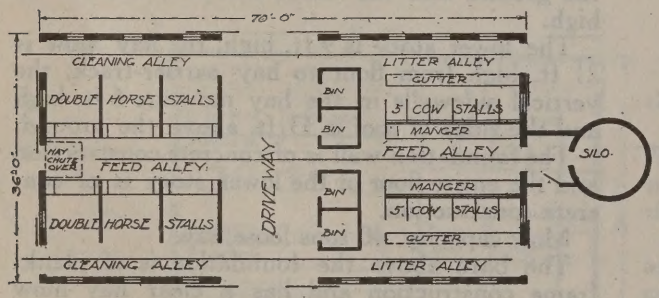
The cost is estimated to be $1600.00.

Modern dairy barns equipped with modern labor saving and sanitary appliances is the foundation of economy, and produces the kind of milk that brings the best prices.

Price of Complete working plans and specifications for Design 1788 ..... $5.00



Design 1842—For 10 Cows and 12 Horses



Description

This barn is 36 ft. wide by 70 ft. long.

The foundation wall extends 12 inches above the ground and the frame sidewalls are 16 ft. high.

The lower story is 10 ft. high, the hay mow is 22 ft. high from the floor to hay carrier-track, the vertical sidewalls in the hay mow are 5 ft. high, and the ridge of roof is 35 ft. above the ground.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

Mow capacity, 80 tons loose hay.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

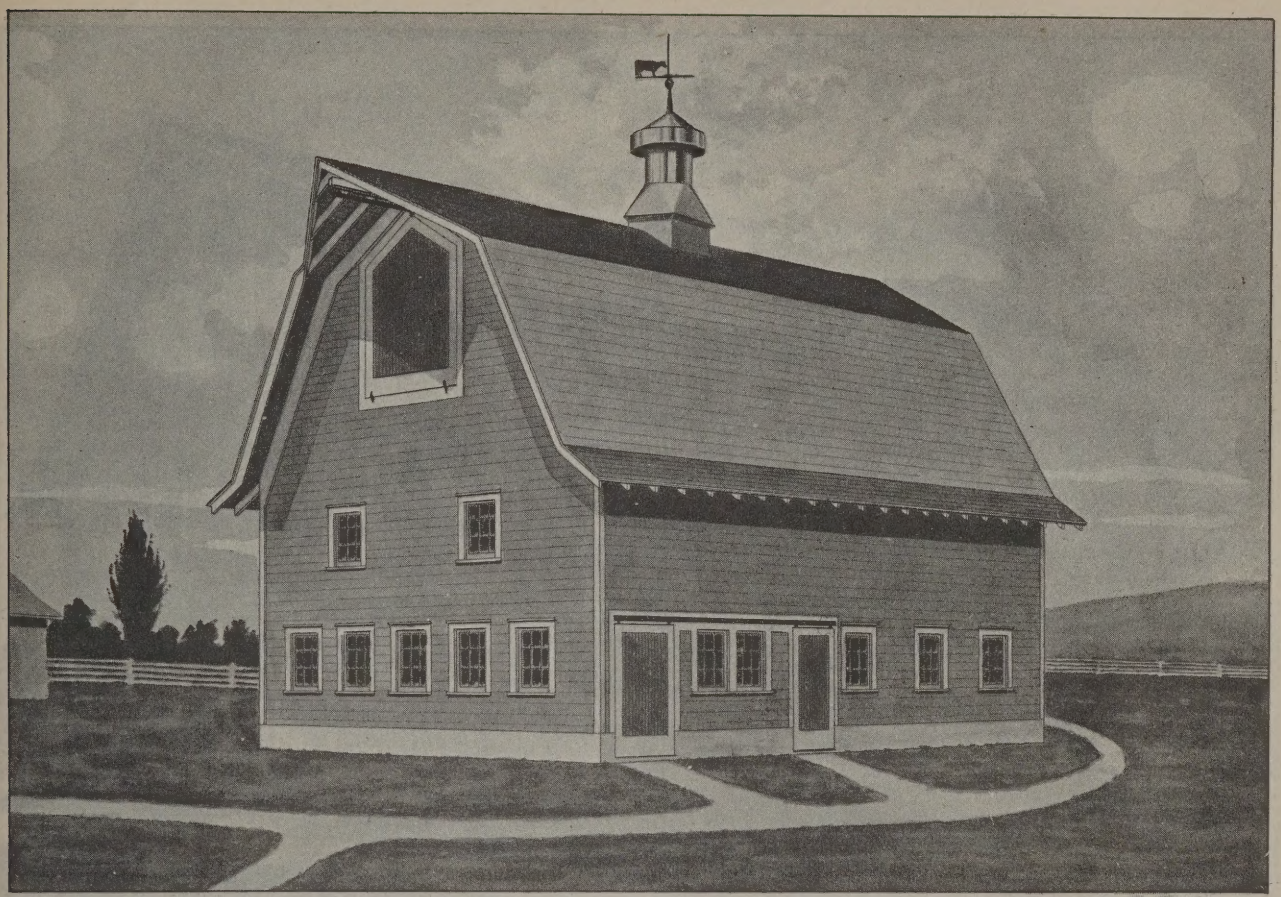
The cost is estimated to be $2500.00.

Louden Machinery Company,
Gentlemen:

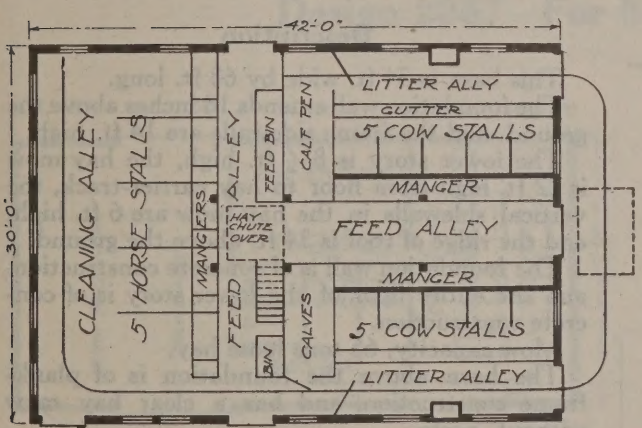
My barn is equipped with a Louden Hay Carrier and slings which I bought of you the fall of 1910. The slings are the largest you sold. I can unload 1,000 lbs. at each pull, easy. I have a very large door, 9x12. I consider the outfit good in every way. Yours truly,

John H. Schlag, Redstone, Mont.

Price of Complete working plans and specifications for Design 1842 ..... $5.00



Design 1508—For 10 Cows and 5 Horses



Description

This barn is 30 ft. wide by 42 ft. long.

The foundation wall extends 18 inches above the ground, and the frame sidewalls are 14 ft. high.

The lower story is 8 ft. high, the hay mow is 21 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 7 ft. high, and the ridge of the roof is 30 ft. above the ground.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

Mow capacity, 40 tons loose hay.

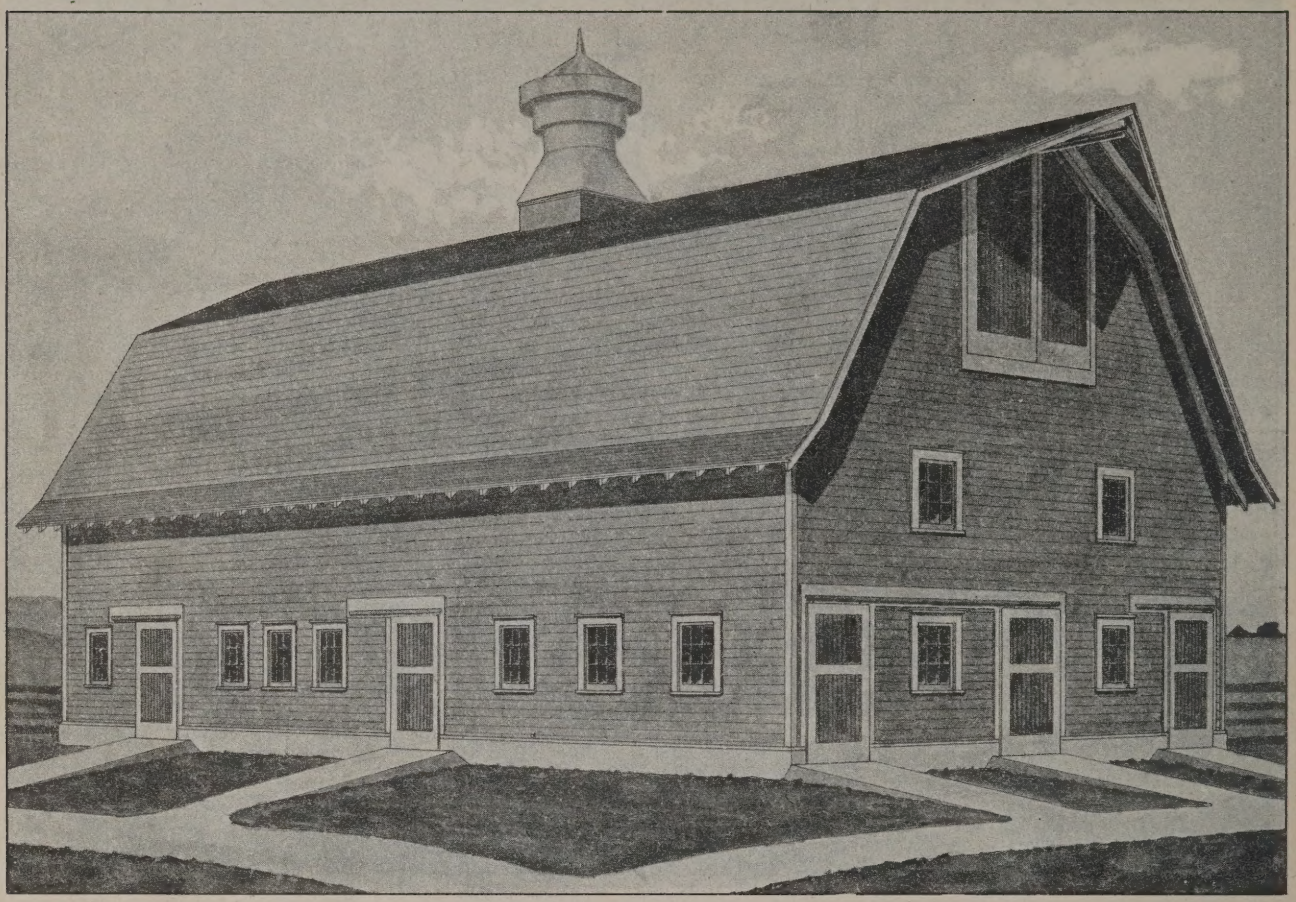
The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $1400.00.

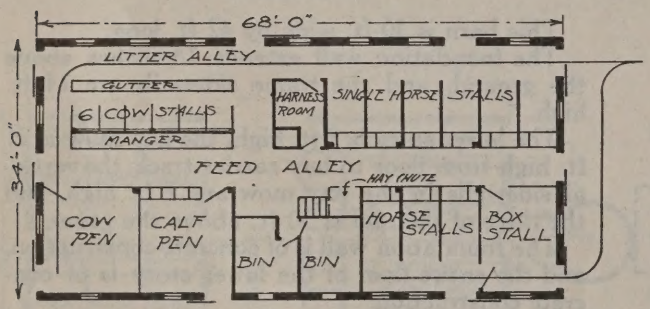
This barn has a convenient arrangement for feeding hay and grain. The hay chute is well located and the mow has storage capacity for about 40 tons of loose hay.

Comfort for Your Cows Means More Dollars for YOU

Price of Complete working plans and specifications for Design 1508 ..... $5.00



Design 1797—For 6 Cows and 10 Horses



Louden Machinery Co.,
Gentlemen:

We are more than pleased with the Litter Carrier purchased of you. Don't see how we could get along without it. Have given it hard service since we installed it, but it is as good, practically, as new; no weak flimsy parts to your Carrier.

Your cow stanchions are certainly dandies. We have used your tools for twenty-five years and find no fault with them.

Yours truly,
Stephen Holtkamp,
Pilot Grove, Iowa.

Description

This barn is 34 ft. wide by 68 ft. long.

The foundation wall extends 18 inches above the ground, and the frame sidewalls are 14 ft. high.

The lower story is 8½ ft. high, the hay mow is 22 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 6 ft. high, and the ridge of roof is 34 ft. above the ground.

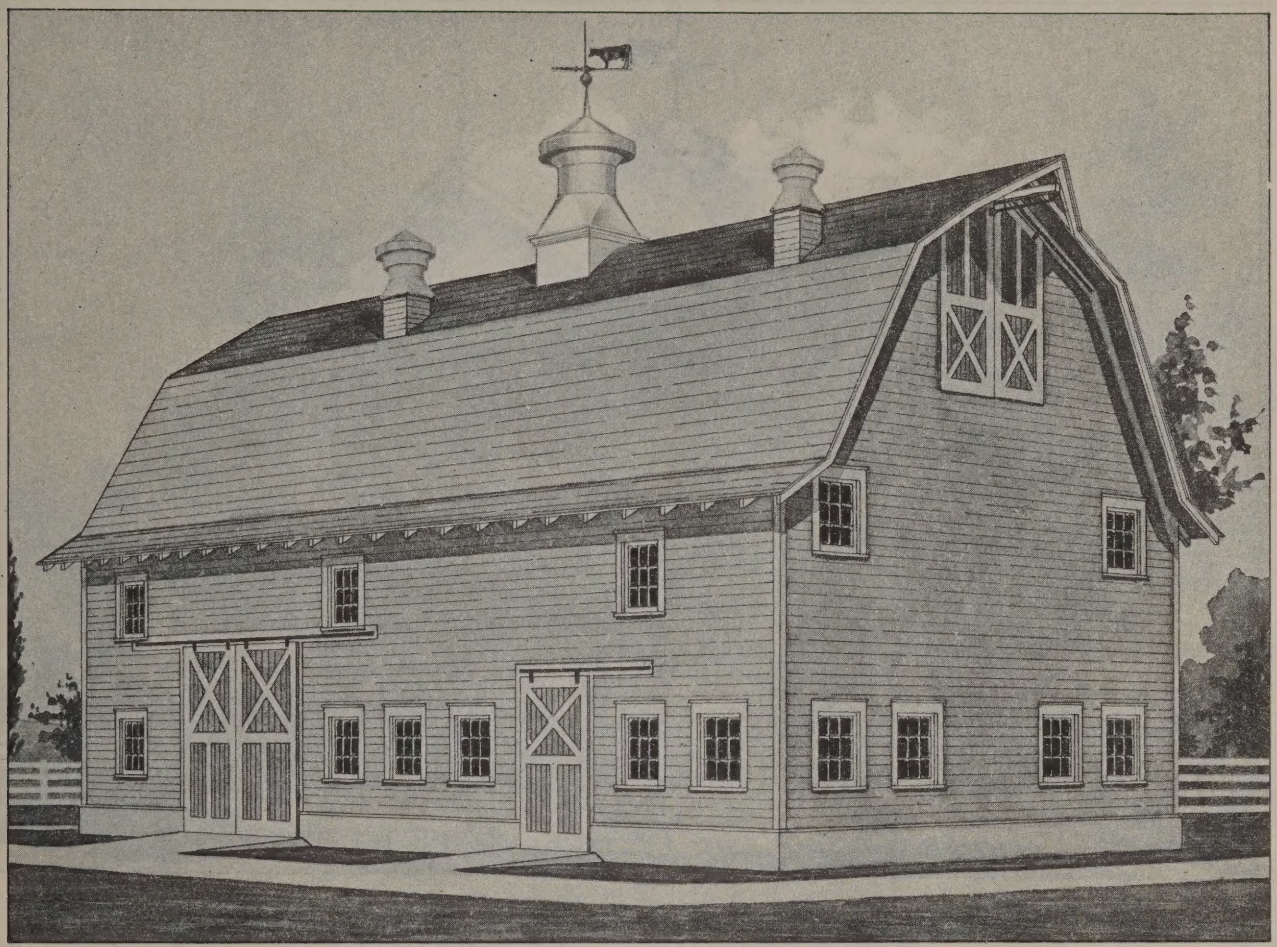
The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

Mow capacity, 65 tons loose hay.

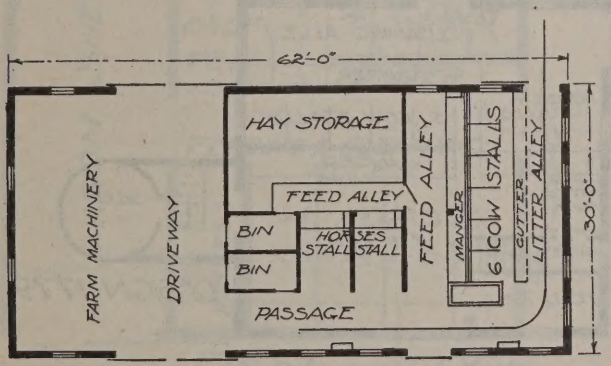
The barn above the foundation is of plank-frame construction, and has a clear hay mow without posts.

The cost is estimated to be $3200.00.

Price of Complete working plans and specifications for Design 1797 ..... $5.00



Design 2067—For 6 Cows and 2 Horses



Description

This barn is 30 ft. wide by 62 ft. long.

The foundation wall extends 24 inches above the ground, and the frame sidewalls are 16 ft. high.

The lower story is 9½ ft. high, the hay mow is 21 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 7 ft. high, and the ridge of roof is 34 ft. above the ground.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

Mow capacity, 64 tons loose hay.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $2000.00.

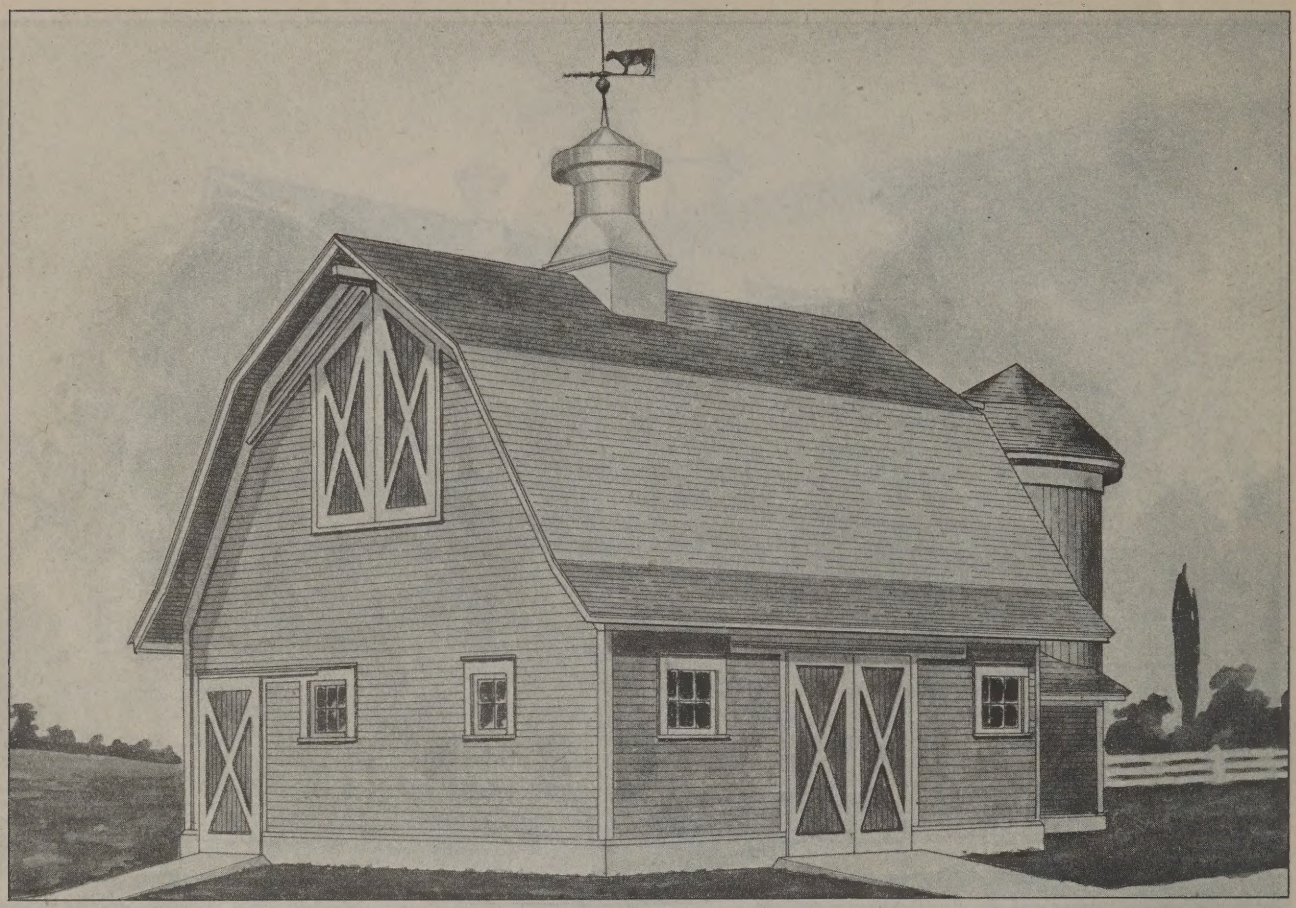
Louden Machinery Company,

Gentlemen:

I firmly believe you have the best cow barn equipment on the market today. Yours very truly,

F. H. Schwartz,
Designer and Contractor,
Galesburg, Ill.

Price of Complete working plans and specifications for Design 2067 ..... $5.00



Design 1779—For 5 Cows, 2 Horses, etc.

Description

This barn is 28 ft. wide by 31 ft. long.

The foundation wall extends 18 inches above the ground, and the frame sidewalls are 9½ ft. high.

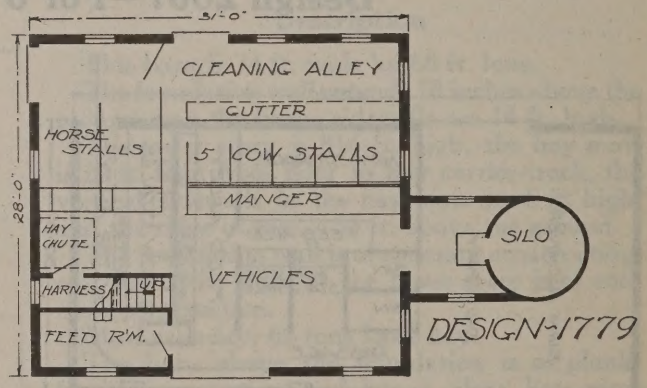
The lower story is 9½ ft. high, the hay mow is 14 ft. high from floor to hay carrier-track, and the ridge of roof is 28 ft. above the ground.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

Mow capacity, 12 tons loose hay.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $1200.00.

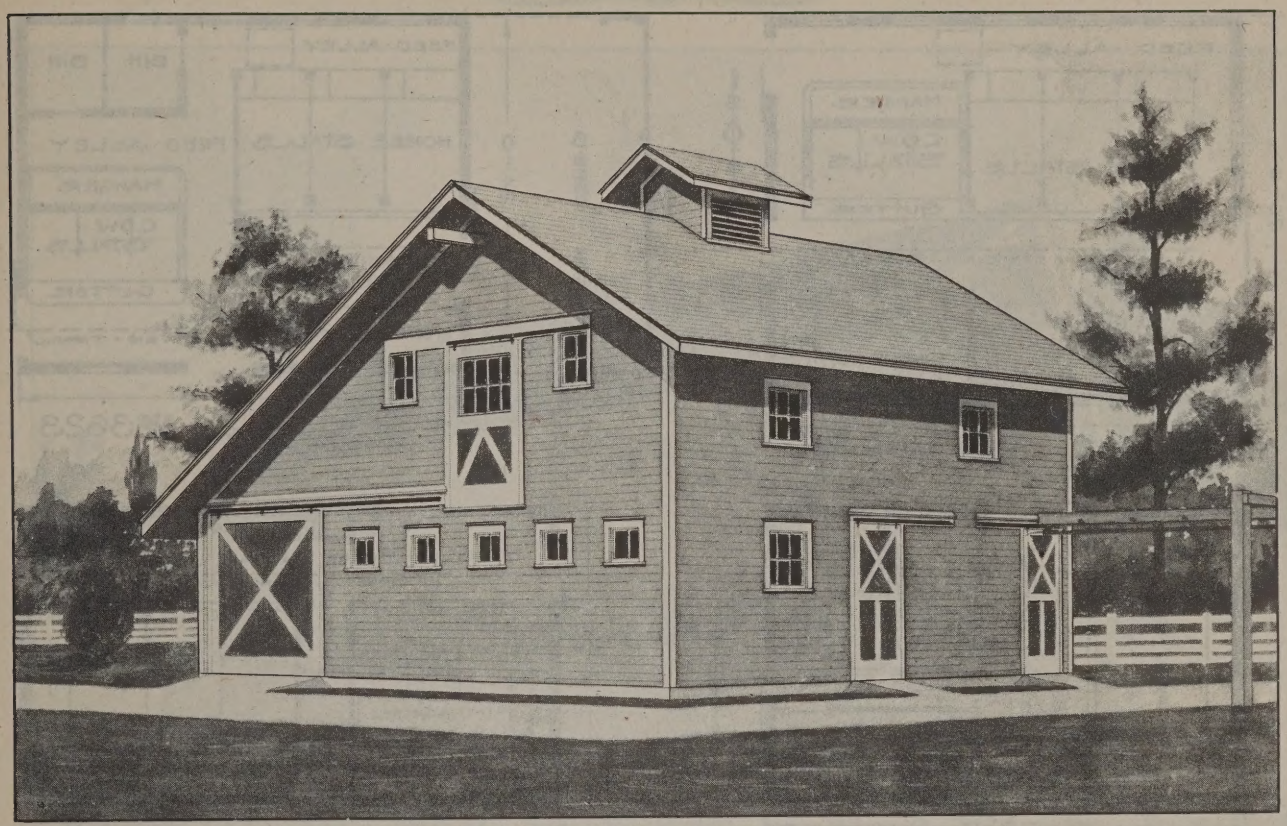


Price of Complete working plans and specifications for Design 1779 ..... $5.00

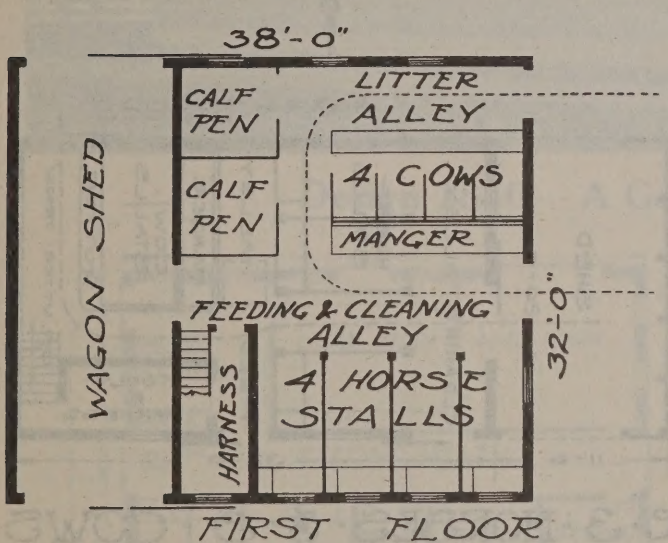
Miller-Cahoon Co., Murray, Utah.
Gentlemen:

I take pleasure in letting you know that the Louden stanchions placed in our barns have given us entire satisfaction. They are very easily manipulated and kept clean. Very truly yours,

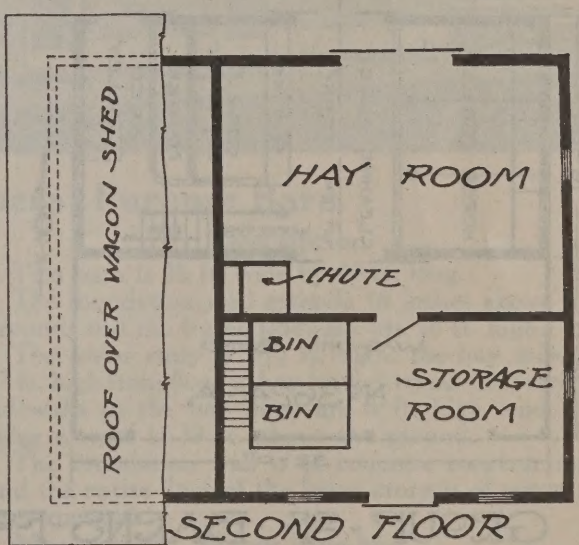
George L. Smith, Smith Brothers Jersey Farm,
Salt Lake City, Utah.



Design 2420 — For 4 Cows and 4 Horses



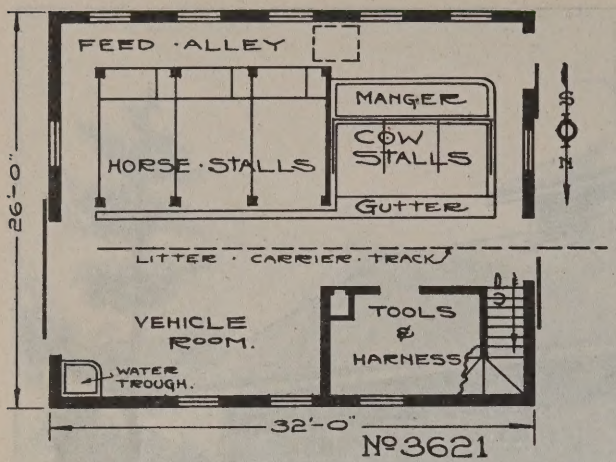
The cost is estimated to be $1100.00



Mow capacity, 10 tons loose hay.

Louden Machinery Company,
Gentlemen:
We installed one of your litter carrier outfits last fall and we find it exactly as represented. We find it one of the greatest time and labor savers on the farm. It has to be used to be appreciated
Respectfully,
C. M. Harness, Galveston, Indiana.

Price of Complete working plans and specifications for Design 2420 ..... $5.00



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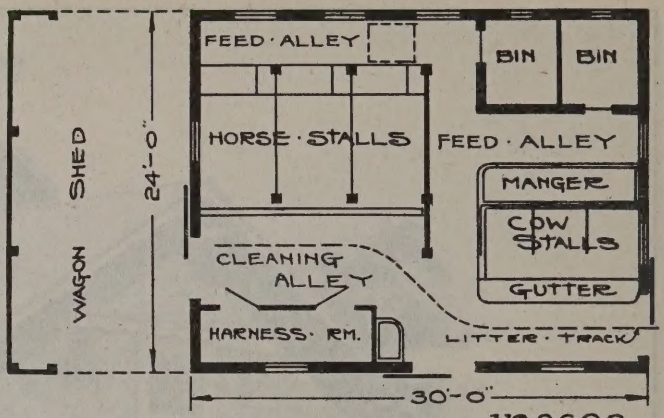

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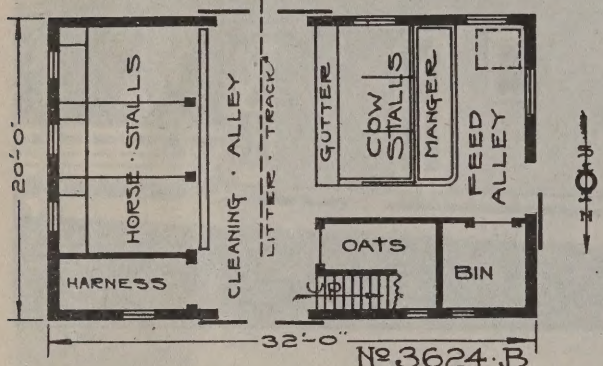

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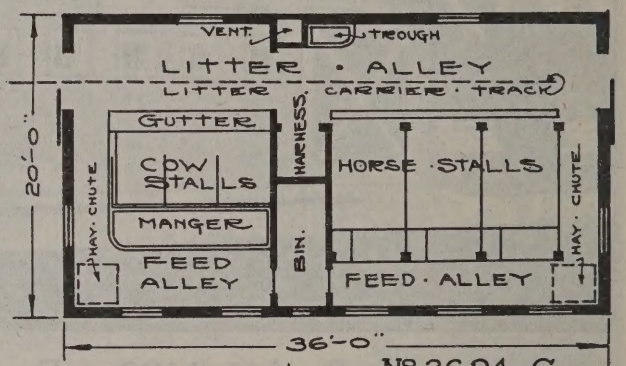

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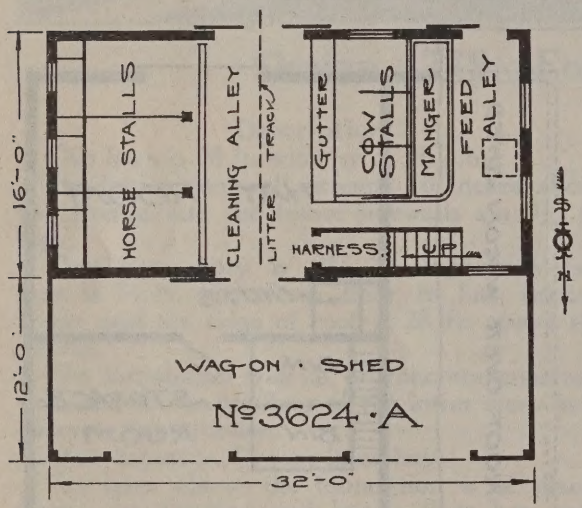

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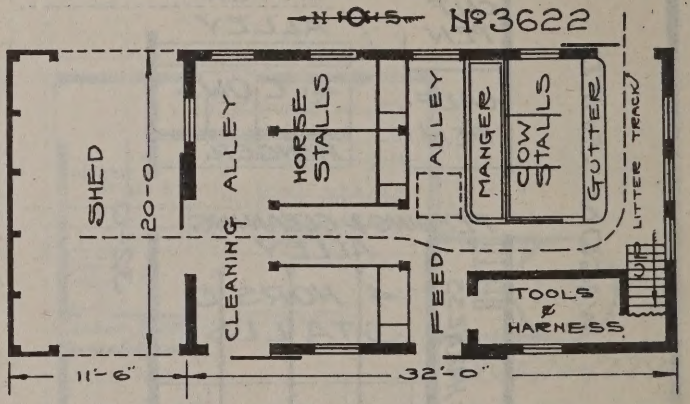
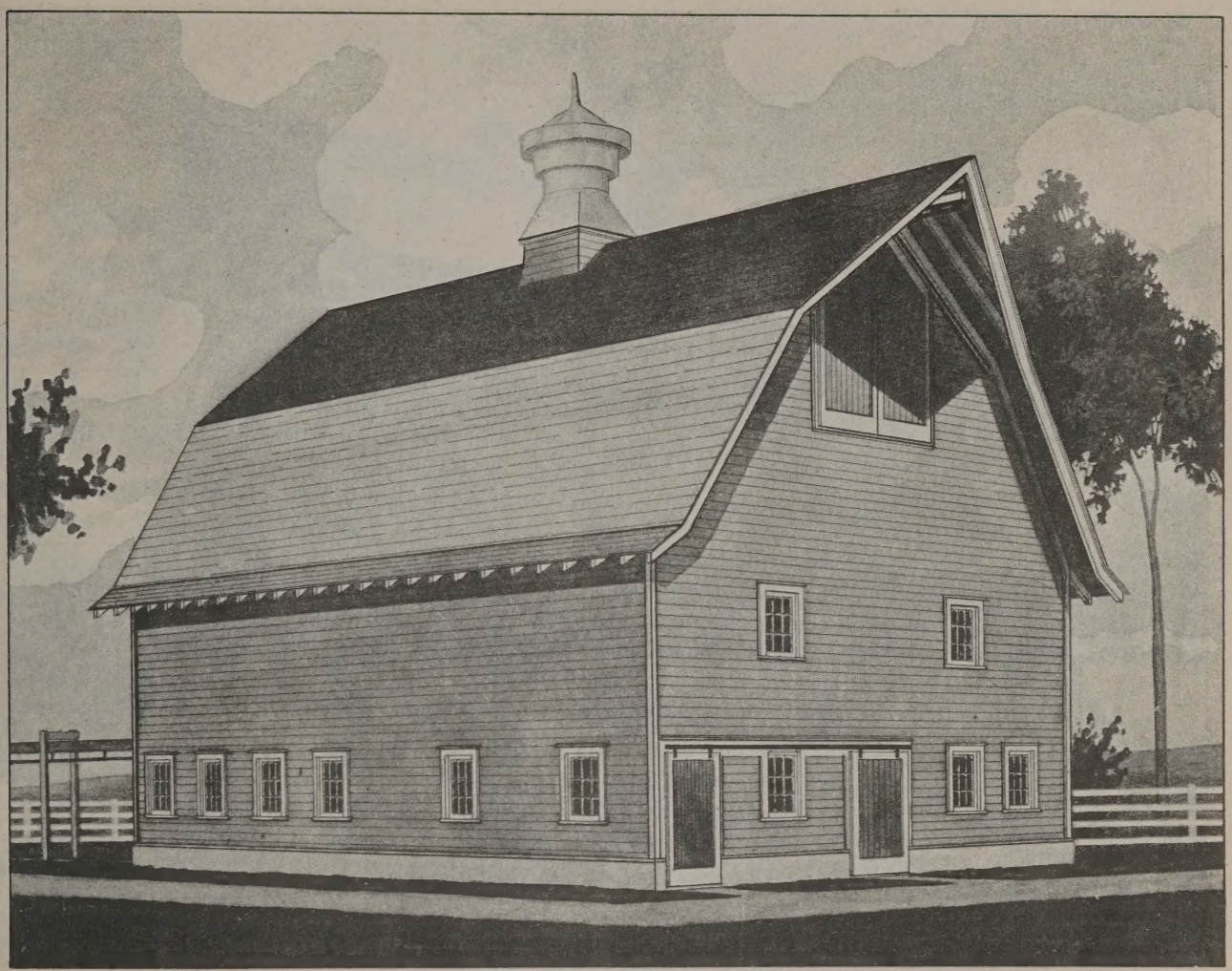


GROUP · OF · BARNS · FOR · 3 · HORSES · & · 3 · COWS

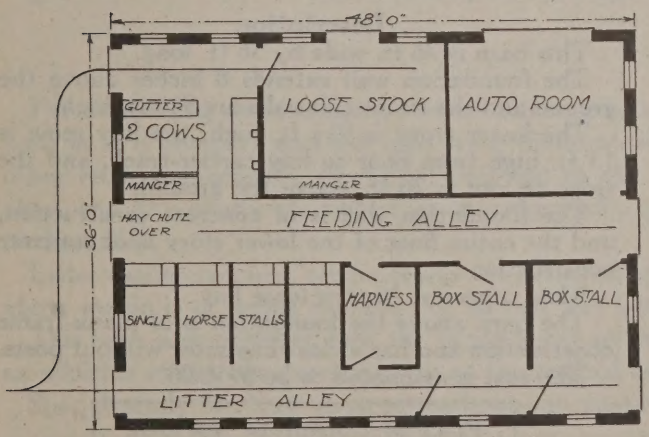
If you are interested in one of these plans write us for particulars of the one you like and we will be pleased to give a full explanation of the same. These barns are all very practical for the man with a small place and are inexpensive to build.

Price of Complete working plans and specifications

Each $5.00



Design 1830—A General Purpose Barn



Quality is the foundation of Louden Equipment

Description

This barn is 36 ft. wide by 48 ft. long.

The foundation wall extends 18 inches above the ground, and the frame sidewalls are 16 ft. high.

The lower story is 8½ ft. high, the hay mow is 27 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 8 ft. high, and the ridge of roof is 39 ft. above the ground.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

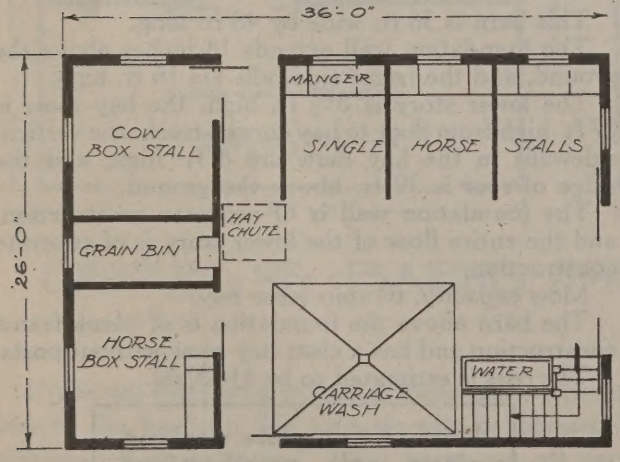
Mow capacity, 64 tons loose hay.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $1820.00.

Price of Complete working plans and specifications for Design 1830 ..... $5.00

Design 2051 — General Purpose Barn



Louden Barn Equipment has been the best for 50 years

Description

This barn is 26 ft. wide by 36 ft. long.

The foundation wall extends 8 inches above the ground and the frame sidewalls are 9½ ft. high.

The lower story is 9½ ft. high, the hay mow is 13 ft. high from floor to hay carrier-track, and the ridge of roof is 26 ft. above the ground.

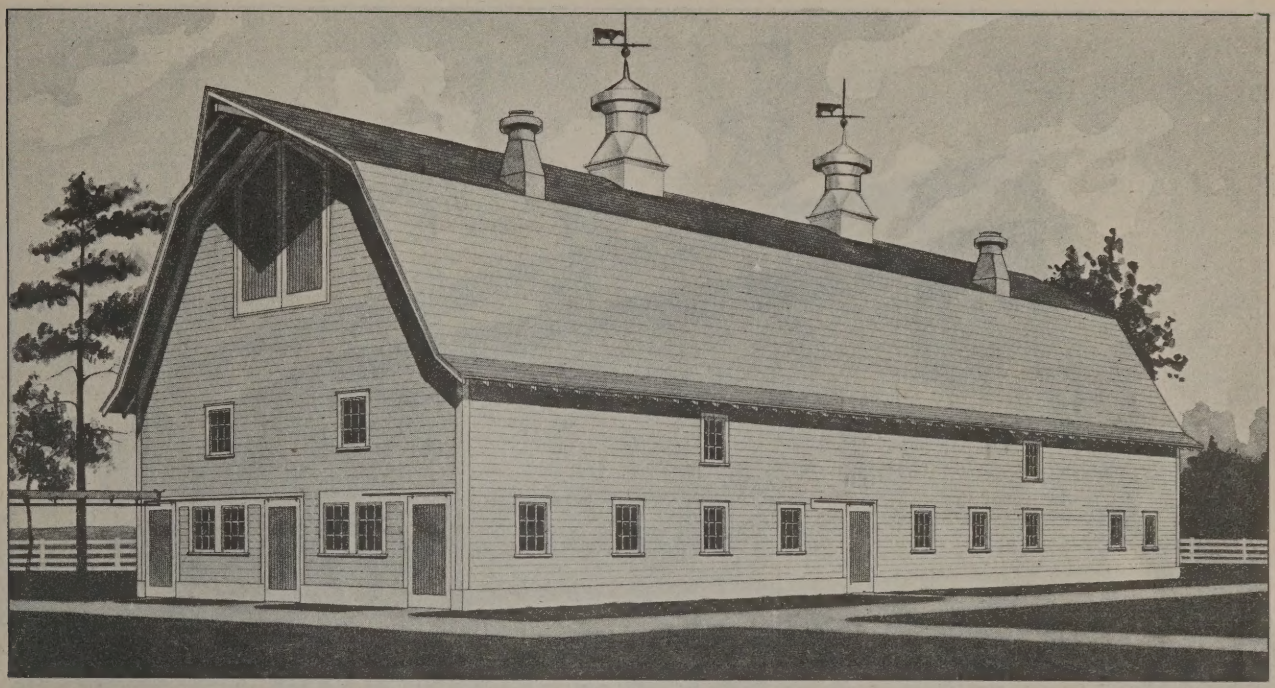
The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

Mow capacity, 16 tons loose hay.

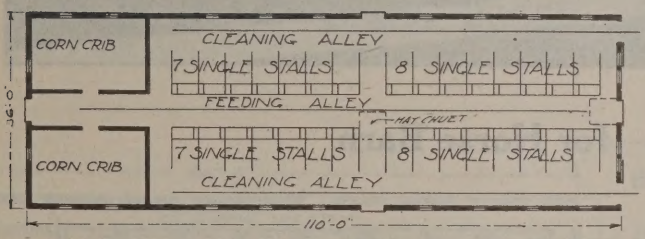
The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $950.00.

Price of Complete working plans and specifications for Design 2051 ..... $5.00



Design 1552—Barn for 30 Horses



Description

This barn is 36 ft. wide by 110 ft. long.

The foundation wall extends 18 inches above the ground, and the frame sidewalls are 14 ft. high.

The lower story is 8½ ft. high, the hay mow is 24 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 6 ft. high, and the ridge of roof is 36 ft. above the ground.

Mow capacity, 120 tons loose hay.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $3400.00.

For the feeding and sheltering of work horses this makes an ideal barn as it is compact and has corn cribs which can also be used for other feed, conveniently located at one end of the center feeding alley, and hay chutes are located at the other end and center of the feeding alley.

Price of Complete working plans and specifications for Design 1552 ..... $5.00

Litter carrier and feed carrier-tracks are provided for and the mow above stable is of ample capacity for all hay and bedding required for the stock this barn will hold.

This barn is so arranged that the capacity can be increased at any future time by building on one end, an addition of the same construction as the original barn.

Special study has been given to the light and ventilation for the comfort of the horses.

Gentlemen:

The Louden Stalls and Stanchions purchased from you last summer are decidedly satisfactory, especially the Stanchions. We have no trouble in keeping our cows clean. My two boys handle the animals more easily and I notice practically no waste with the feed as with the old system. Have shown the stalls to a number of people.

Very truly yours, Karl C. Schaub, Logan, Utah.

Design 1736—for Horse Barn

Description

This barn is 32 ft. wide by 70 ft. long.

The foundation wall extends 18 inches above the ground, and the frame sidewalls are 14 ft. high.

The lower story is 9 ft. high, the hay mow is 22 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 5 ft. high, and the ridge of roof is 34 ft. above the ground.

Mow capacity, 65 tons loose hay.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

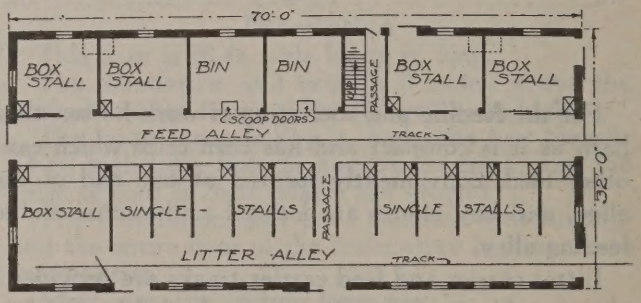
The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $2725.00.

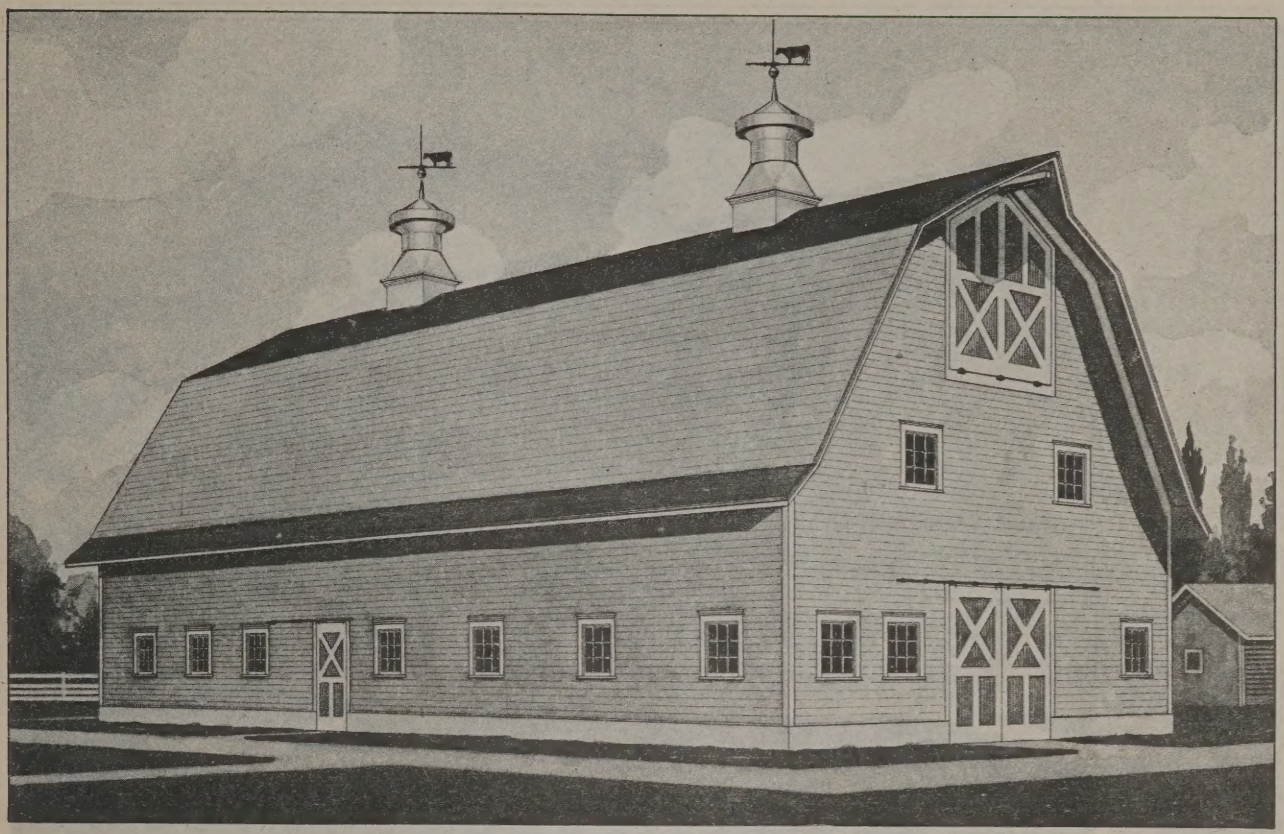
This makes a very convenient horse barn.

The feed bins are well located for the distribution of feed and the stairway to the hay mow is also in a convenient location. The mow will hold 65 tons of hay and bedding and has room for additional grain bins.

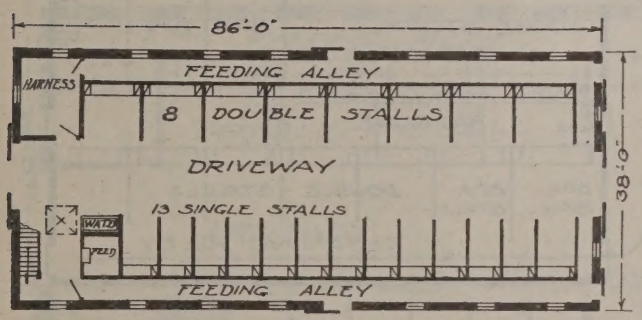
Feed and litter carrier-tracks can be installed as shown for handling all feed and litter with the minimum time and labor.



Price of Complete working plans and specifications for Design 1736 $5.00



Design 2065B—For 29 Horses



Description

This barn is 38 ft. wide by 86 ft. long.

The foundation wall extends 18 inches above the floor and the frame sidewalls are 14 ft. high.

The lower story is 10 ft. high, the hay mow is 24 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 4 ft. high, and the ridge of roof is 37 ft. above the ground.

Mow capacity, 100 tons loose hay.

The foundation wall is of concrete construction and the entire floor of the lower story is of concrete construction.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $3180.00.

Louden Machinery Co.,

Gentlemen: Three years ago I purchased twenty of your steel stalls and stanchions, and have them installed in my barn. Since then I have found them to give perfect satisfaction in every way. They are just as good as the day they were put up, and I feel quite confident they will last a life time. I can heartily recommend them to any one installing stanchions and stalls. I also put in one of your litter carriers, using 280 ft. of track, and found it to be a great labour-saving device. I consider the stanchions, stalls and litter carrier to be ahead of any others I have ever seen.

Yours truly, Frank Hull, Kerwood, Ontario

Price of Complete working plans and specifications for Design 2065B $5.00

Design 1503 — For 20 Horses

Description

This barn is 36 ft. wide by 62 ft. long.

The foundation wall extends 18 inches above the ground and the frame sidewalls are 14 ft. high.

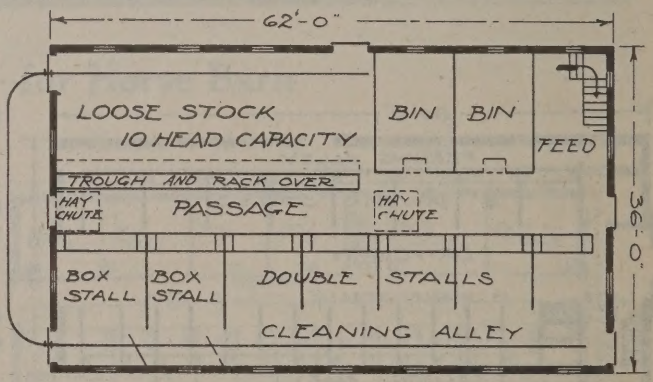
The lower story is 9 ft. high, the hay mow is 23 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 6 ft. high, and the ridge of roof is 36 ft. above the ground.

Mow capacity, 68 tons loose hay.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $2050.00.



Price of Complete working plans and specifications for Design 1503 ..... $5.00

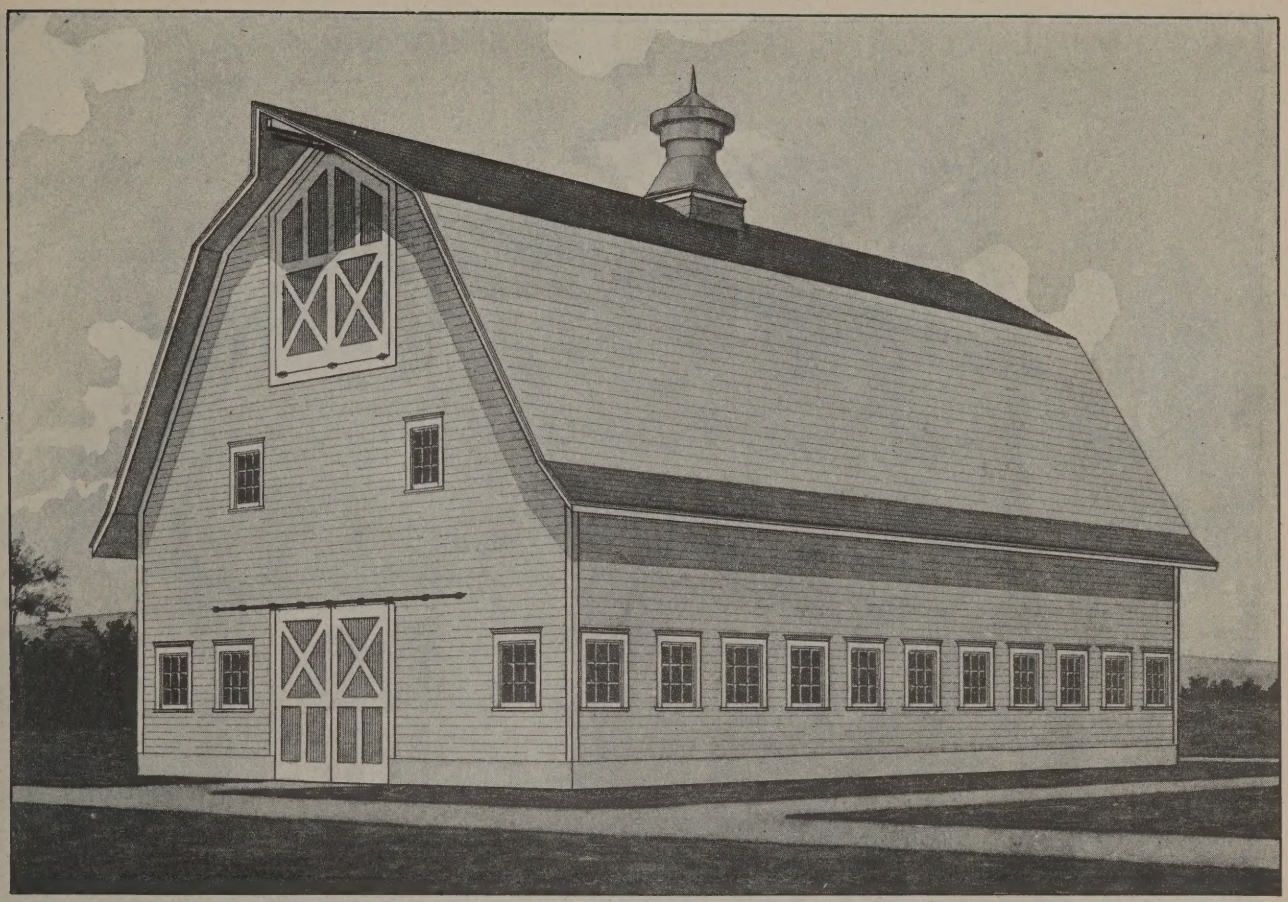
The space for loose stock in this barn can be used for the feeding of beef cattle, colts, or young stock, and it can at any time be used for dairy cow stalls.

The feed bins are of large capacity and conveniently located. The hay mow has capacity for about 65 tons of hay and bedding which can be thrown down through chutes in the feeding alley ceiling.

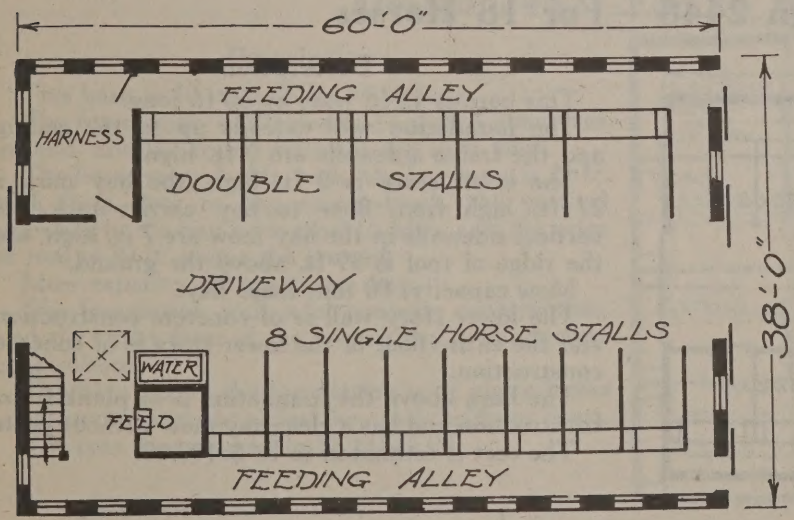
Louden Machinery Company,

Dear Sirs: I am remodeling my barn and am using the all steel Louden stanchions again. We have used these cow stanchions about 12 years and they are good enough yet.

Very respectfully,
O. A. Hanneman.



Design 2065A—For 18 Horses



Gentlemen:

Am pleased to say that the Louden Stalls and Feed and Litter Carriers purchased from you for our new barn have proved satisfactory. We are pleased with them in every particular.

Yours very truly, John Michels,
Milwaukee County School of Agriculture and Domestic Economy,
Wauwatosa, Wis.

Description

This barn is 38 ft. wide by 60 ft. long.

The foundation wall extends 18 inches above the ground, and the frame sidewalls are 14 ft. high.

The lower story is 10 ft. high, the hay mow is 24 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 4 ft. high, and the ridge of roof is 38 ft. above the ground.

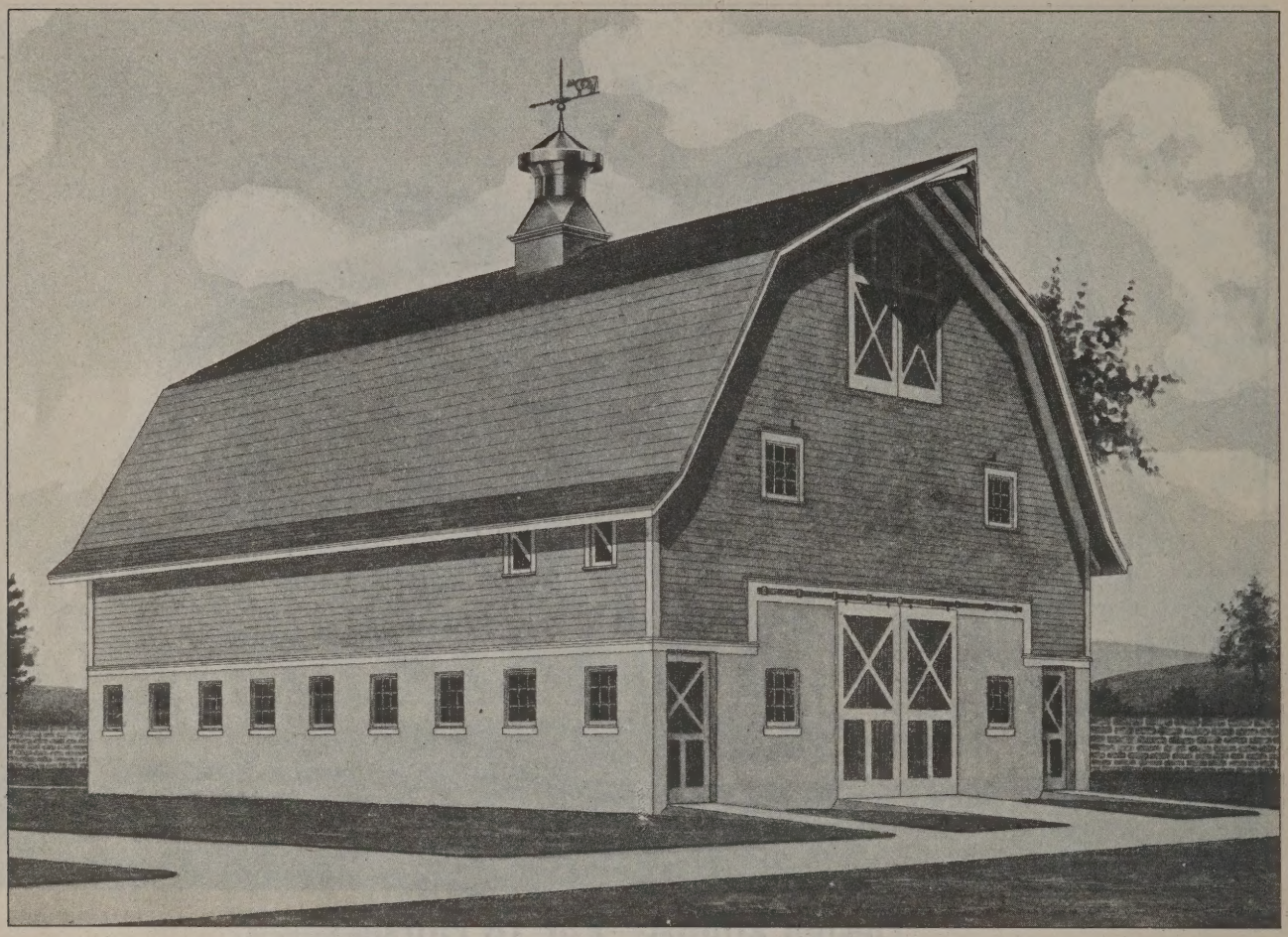
Mow capacity, 80 tons loose hay.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

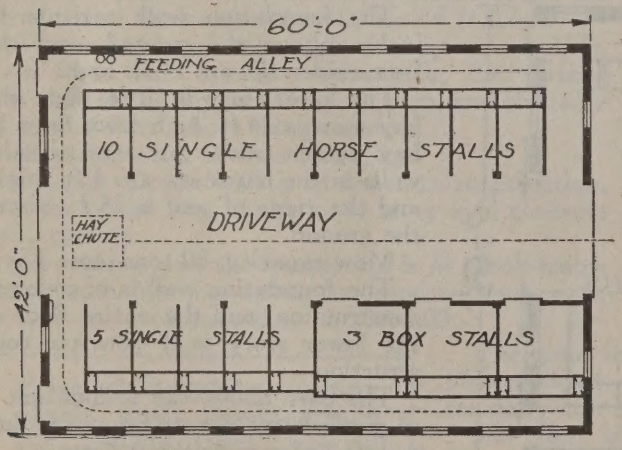
The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $1900.00.

Price of Complete working plans and specifications for Design 2065A **$5.00**



Design 2448—For 18 Horses



Description

This barn is 42 ft. wide by 60 ft. long.

The foundation wall extends up to the ceiling, and the frame sidewalls are 9 ft. high.

The lower story is 9 ft. high, the hay mow is 27 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 7 ft. high, and the ridge of roof is 39 ft. above the ground.

Mow capacity, 80 tons loose hay.

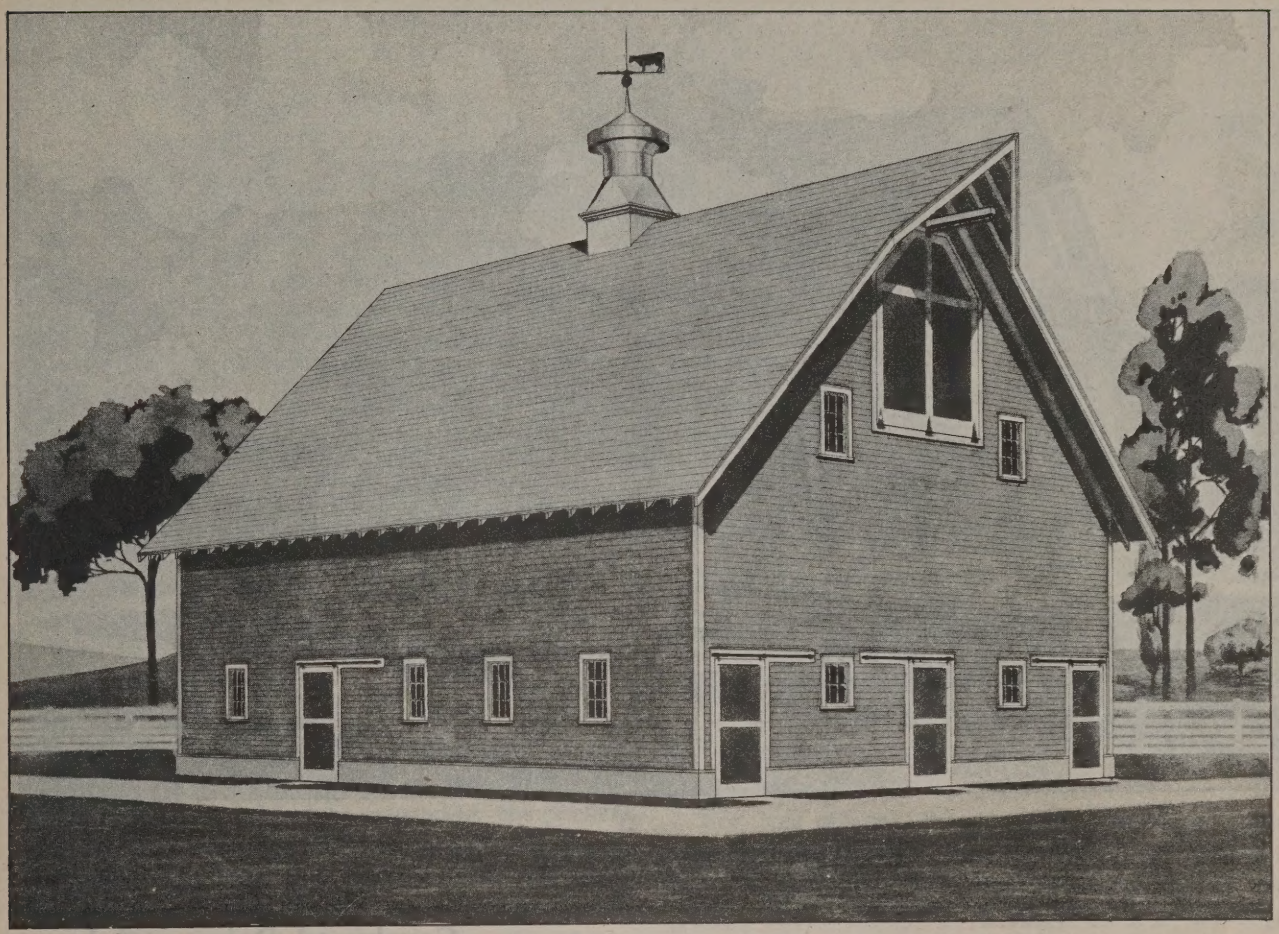
The lower story wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $3100.00.

Louden Machinery Co.,
Gentlemen:
Am pleased to report the Litter Carrier a perfect outfit and giving most excellent satisfaction.
Yours truly, E. E. York, Supt.,
Odd Fellows' Home, Clarksville, Tenn.

Price of Complete working plans and specifications for Design 2448 ..... $5.00



Design 2457—For 14 Horses

Description

This barn is 40 ft. wide by 54 ft. long.

The foundation wall extends 24 inches above the ground, and the frame sidewalls are 16 ft. high.

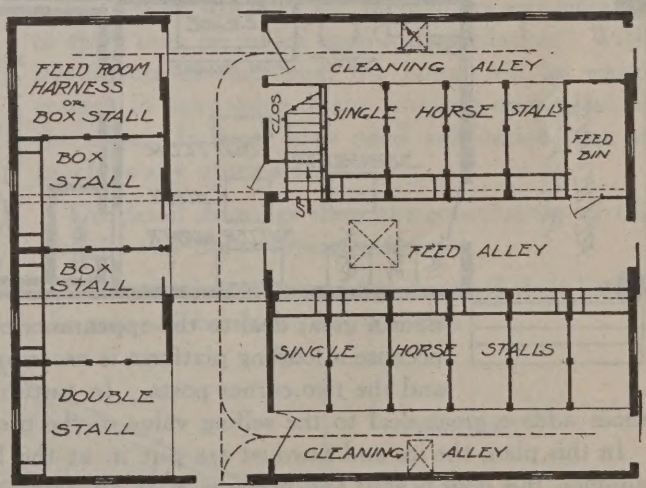
The lower story is 9 ft. high, the hay mow is 23 ft. high from floor to hay carrier-track, the vertical sidewalls in the hay mow are 8 ft. high, and the ridge of roof is 39 ft. above the ground.

Mow capacity, 60 tons loose hay.

The foundation wall is of concrete construction, and the entire floor of the lower story is of concrete construction.

The barn above the foundation is of plank-frame construction and has a clear hay mow without posts.

The cost is estimated to be $1875.00.

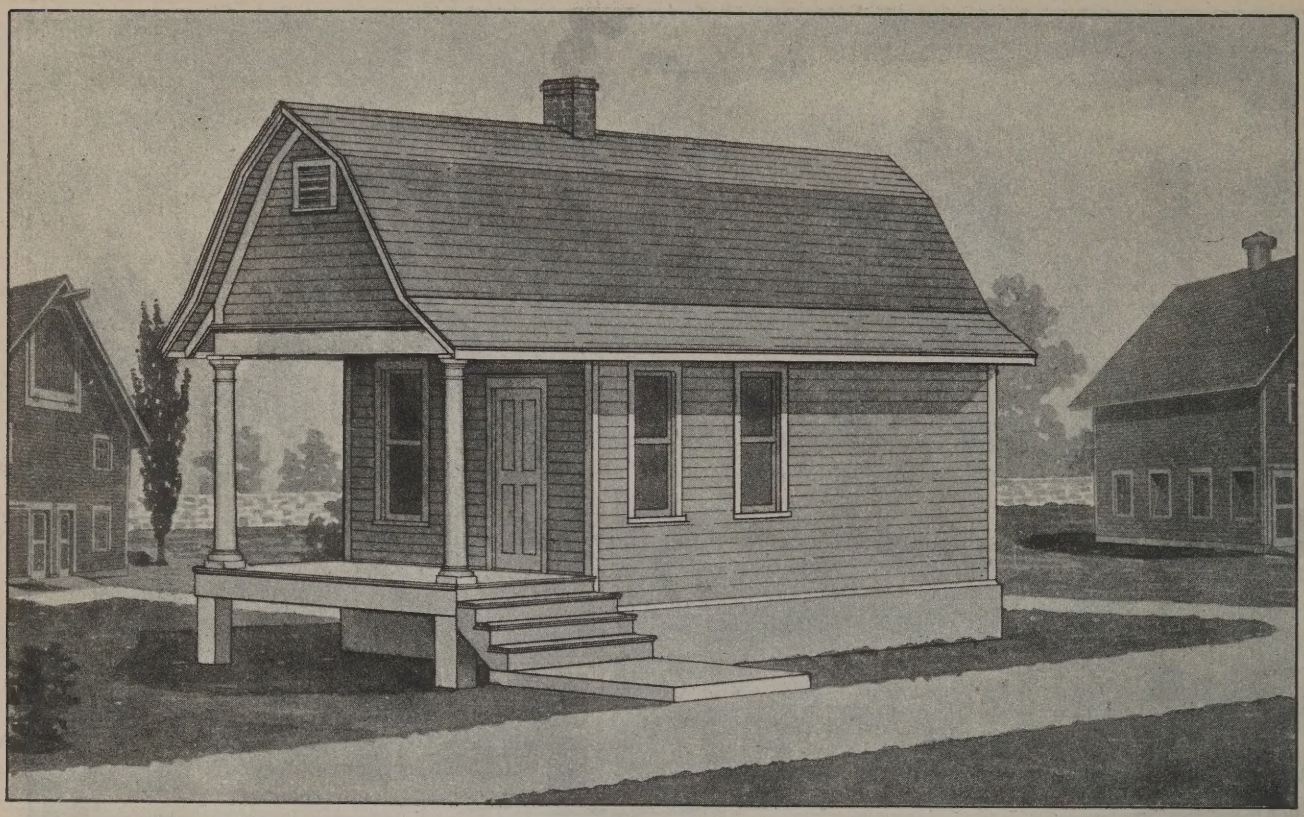


Louden Machinery Company,
Dear Sirs:

The Grapple Fork was the finest thing I ever saw in the way of hay fork, and I will want a good bill from you soon, as I had the misfortune to lose my barn by fire yesterday.

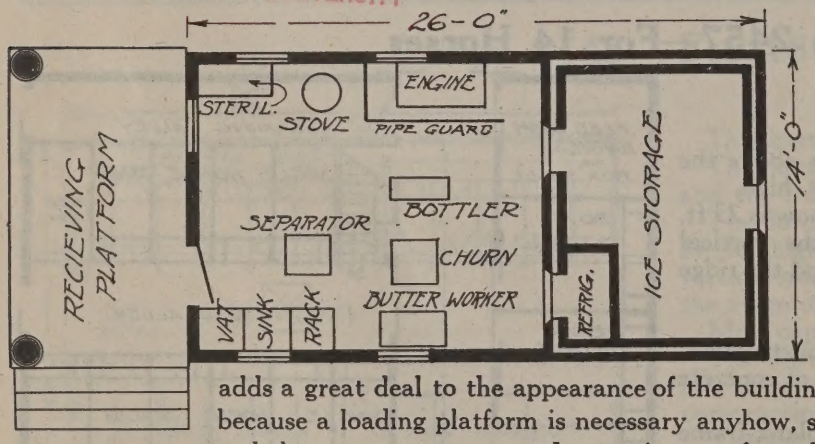
S. C. Armstrong, Surgoinsville, Tenn.

Price of Complete working plans and specifications for Design 2457 ..... $5.00



Design 2600C — Creamery

AVERY LIBRARY
COLUMBIA UNIVERSITY



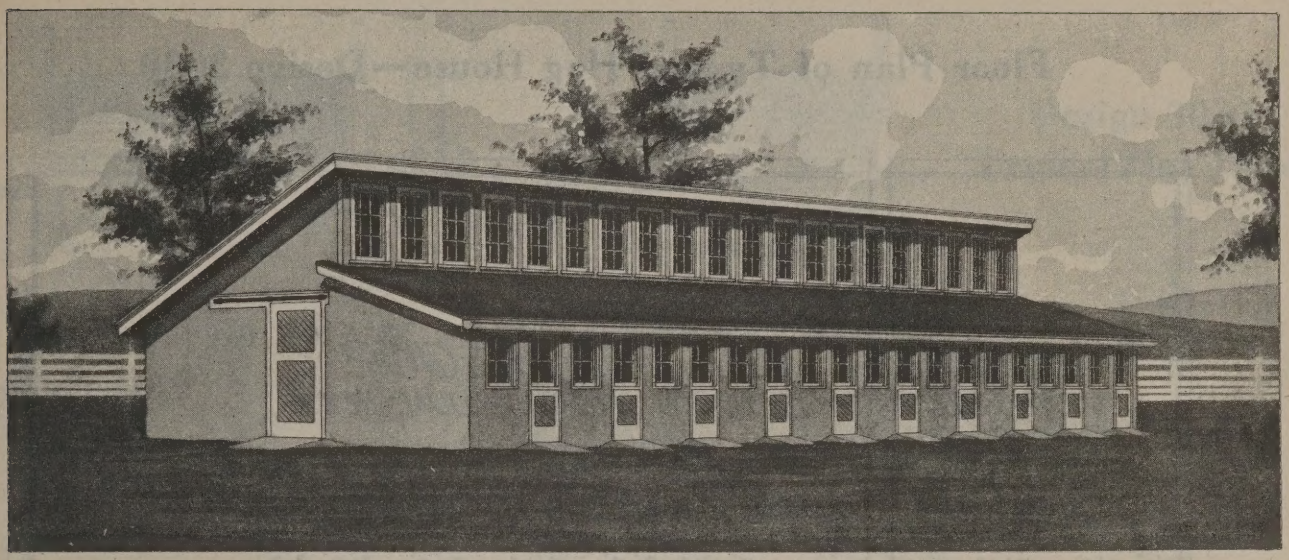
Combined Dairy and Ice House

A very neat and convenient farm dairy and ice house is shown in this design. It gives an opportunity to build in such a way as to add to the appearance of the property, while increasing the profit and convenience of the farm.

The building is 14 by 26 feet, with a porch 8 feet wide. This front porch adds a great deal to the appearance of the building without adding very much to the cost, because a loading platform is necessary anyhow, so the only additional cost is the roof and the two corner posts. In putting up farm buildings, a little attention to appearances adds a great deal to the selling value of the property.

In this plan, the ice and sawdust are put in at the back of the building. After the ice is packed for summer, this door is shut and made as near air tight as possible. When the ice is taken out during the summer, the door into the creamery is used.

The ice house is big enough to hold a block of ice 6 feet wide and 10 feet long, allowing a foot of sawdust all around the ice. It depends upon the size of the dairy whether this will be big enough or not. However, the partition can be moved to make the ice house 12 feet square or the building can be lengthened that much. The design is very neat and attractive, and the idea is a good one.



Design 3030—For 16 Hog Pens

With a house like this, any farmer can raise pure-bred stock and sell the best animals at high prices. Hogs for fattening should be made to weigh from 180 to 200 pounds when they are eight months old. This is generally the most profitable age and weight, and it is the age and weight wanted by the packers. This age and weight mean that each pig must gain 1¼ pounds per day from birth to market time. This is a very profitable gain for hogs to make, and it is reasonable to expect such gains when well bred hogs are well fed and properly cared for in every way.

In this plan, it will be noticed that the pens are small. In practice, it has been found better not to nest more than five or six pigs together. They are better in small lots, even if the pens are made quite small.

When a house is narrow, and built with a double set of windows, it is easier to get the sun into every part of the house than it is when the house is wider. The length, of course, makes no difference in this respect.

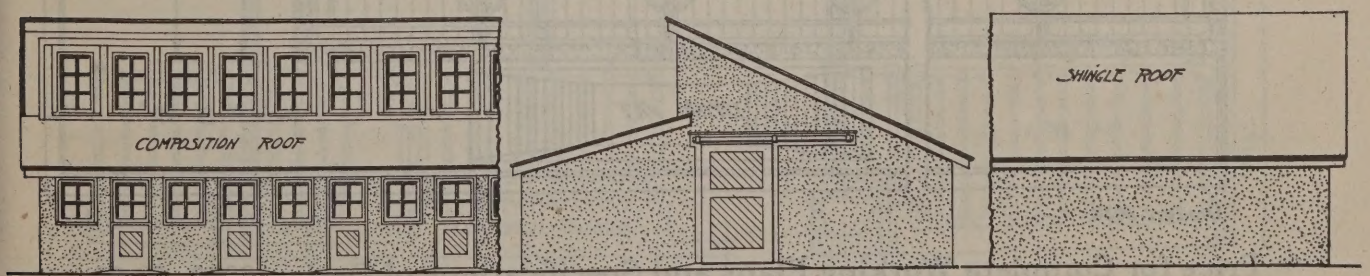
The foundation of the building is concrete, and a concrete floor is spread over the whole surface. A concrete floor in a hog house is almost an absolute necessity, but it is too cold for hogs to sleep on.

For this reason, the nests are placed on loose, wooden floors, that may be moved about for cleaning. These floors are about half the size of the pens. There should be a ridge around the edge of each floor to hold the bedding.

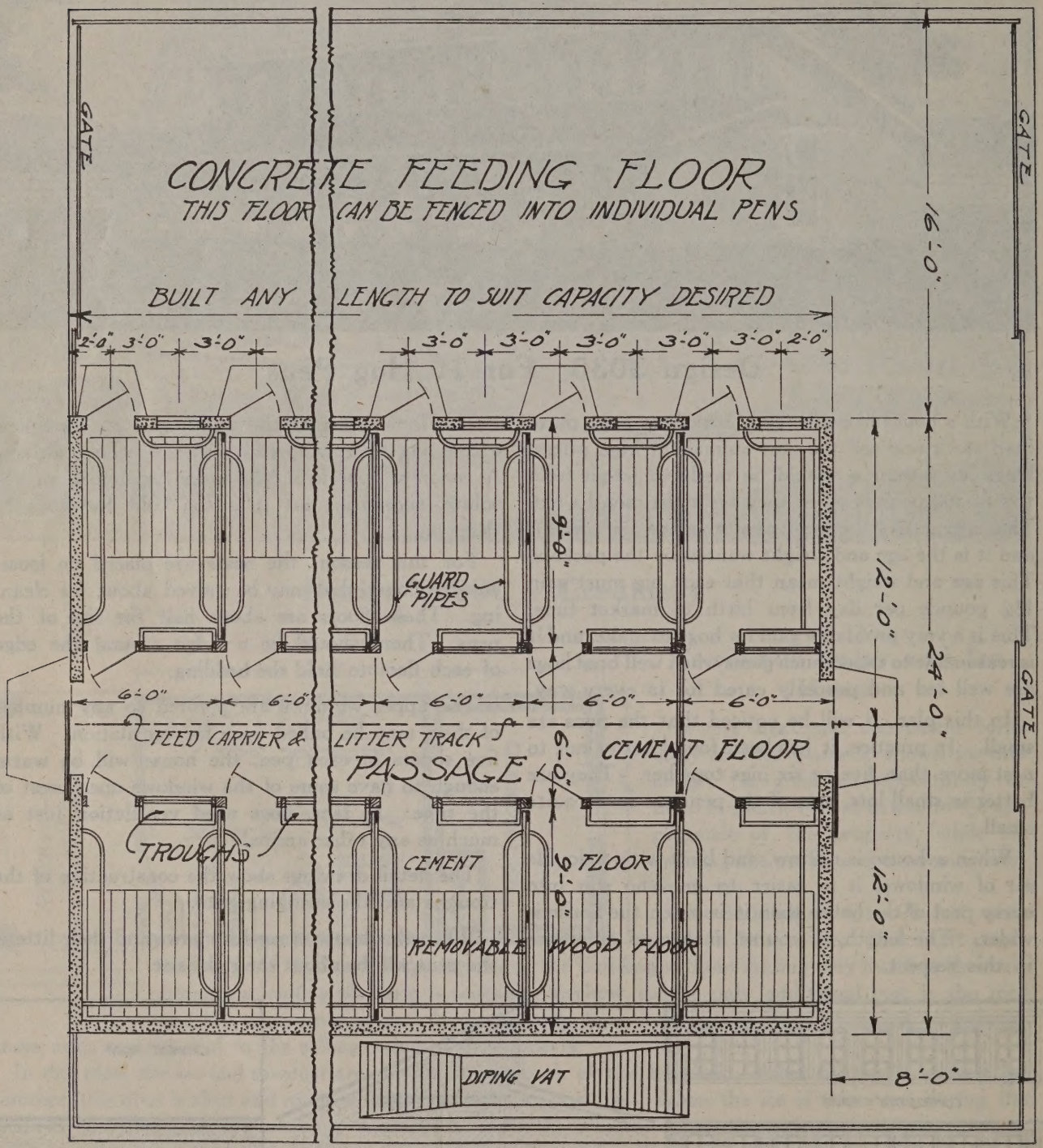
The upper windows are pivoted, so any number of them may be pulled open for ventilation. With five shoats in each pen, the house will be warm enough to have some of the windows open most of the time. In fact, hogs need ventilation just as much as any other animal.

The detail drawings show the construction of the troughs and the swinging gate.

When this house is used for sows and their litters, the pens will be about the right size.

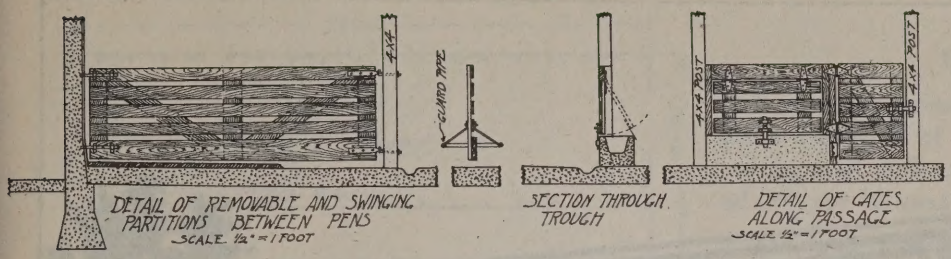


Floor Plan of Typical Hog House—Design 3030

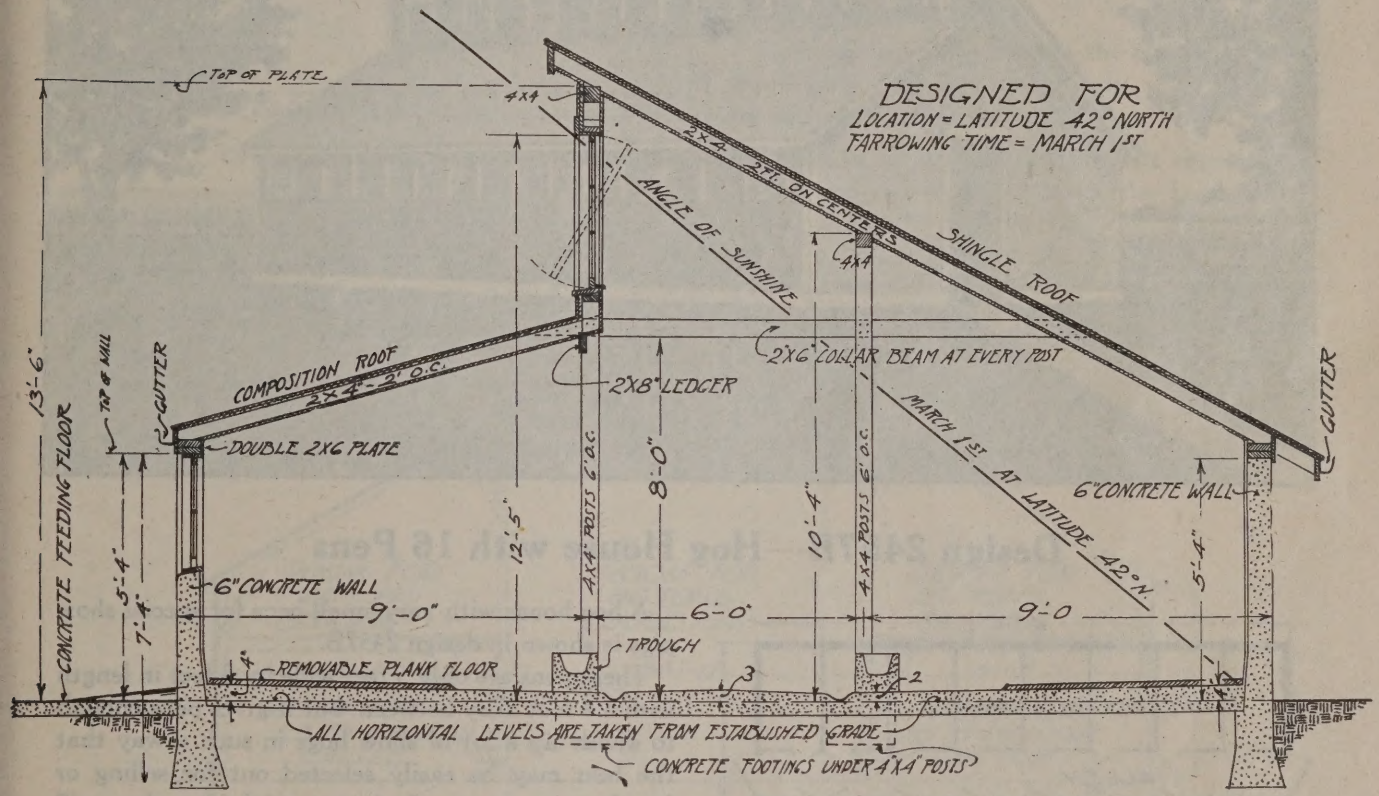


Design 3030

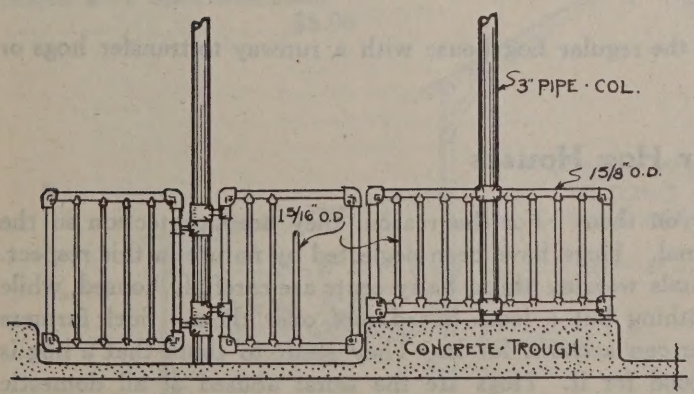
Price for Complete Working Plans and Specifications of Design 3030, $3.00



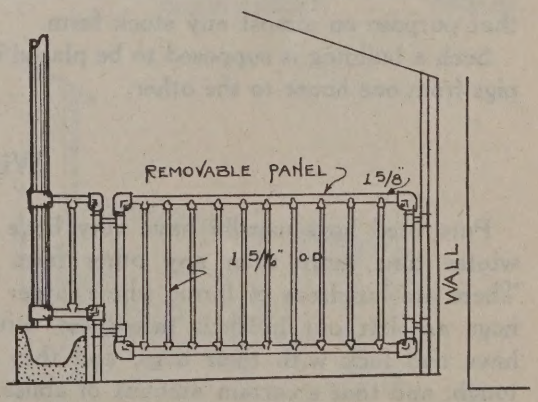
Design 3030
Typical Hog House



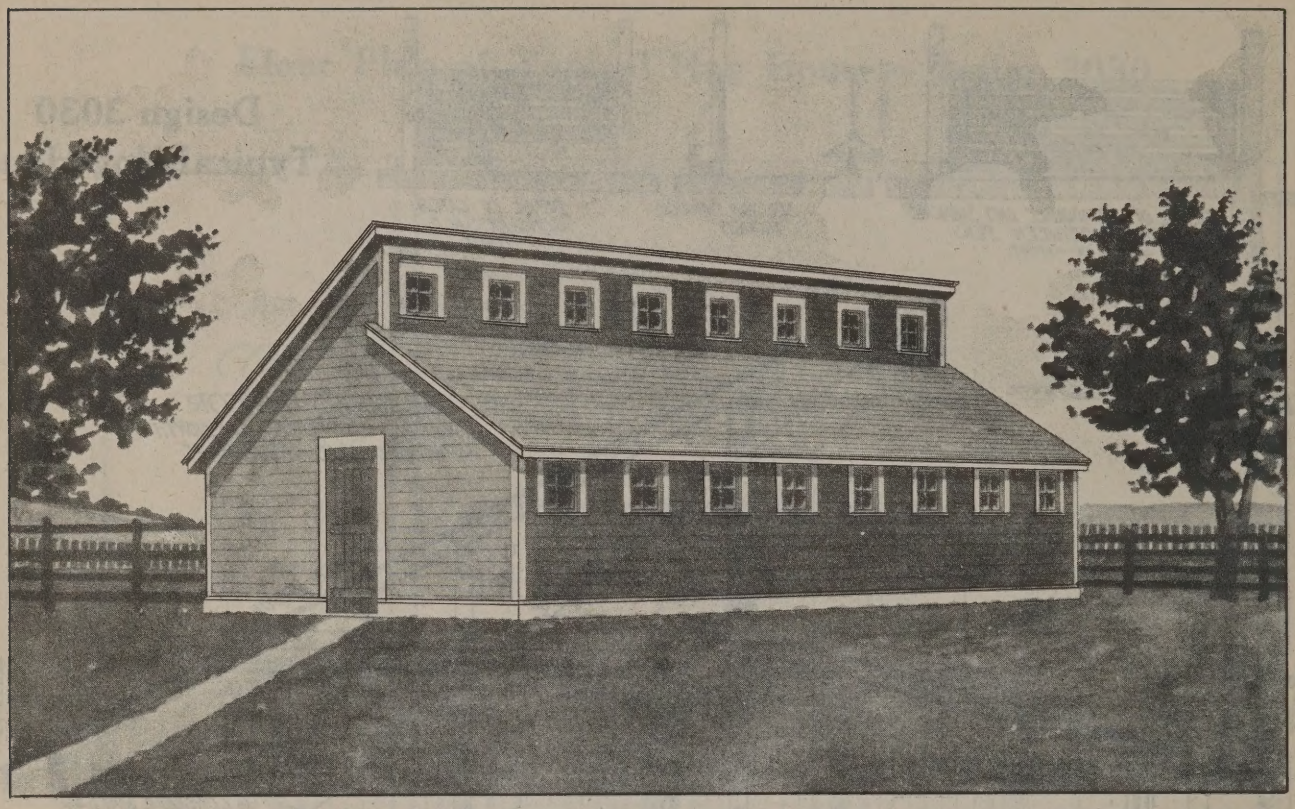
Cross Section of Typical Hog House, Looking West



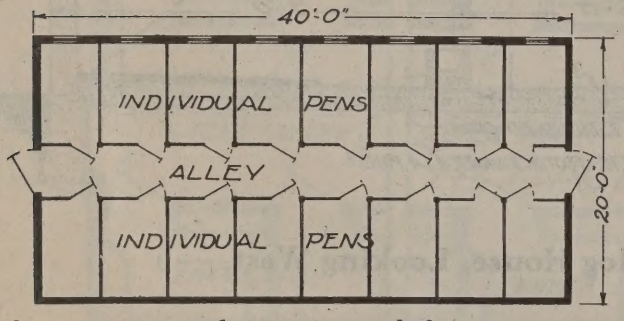
FRONT · PANEL



PARTITION · PANEL



Design 2457B—Hog House with 16 Pens



A hog house with very small pens for special show pigs is shown in design 2457B.

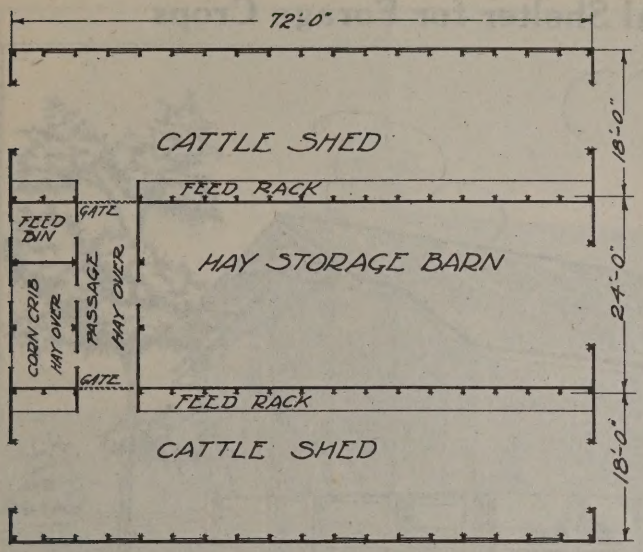
These pens are only 5 feet wide by 8 feet in length with a 4 foot alley between, but it gives pens enough to divide up a lot of show hogs in such a way that the best may be easily selected out for selling or for show purposes. It is a special plan that will appeal to breeders of high priced hogs.

With a very little altering, these pens can be used at farrowing time and probably would be used for that purpose on almost any stock farm.

Such a building is supposed to be placed near the regular hog house with a runway to transfer hogs or pigs from one house to the other.

Winter Hog Houses

Pure bred hogs usually have very little hair on them. For this reason, they need protection in the winter time more than any other farm animal. Hogs have been neglected by nature in this respect. There are hundreds of farms where larger animals wearing thick, hairy coats are carefully housed, while hogs are left out in their nakedness, with nothing but a loose board roof over them. Such farmers have bad luck with their hogs, and they never can account for it. They seem to think that a hog is tough, and that a certain amount of abuse is good for it. Hogs are the worst abused of all domestic animals, and they are among the most profitable when handled intelligently.



Description

Foundation consists of concrete piers. Side walls are made of vertical boarding. Prepared roofing used on flat sheds and shingles or corrugated iron can be used on hay barn.

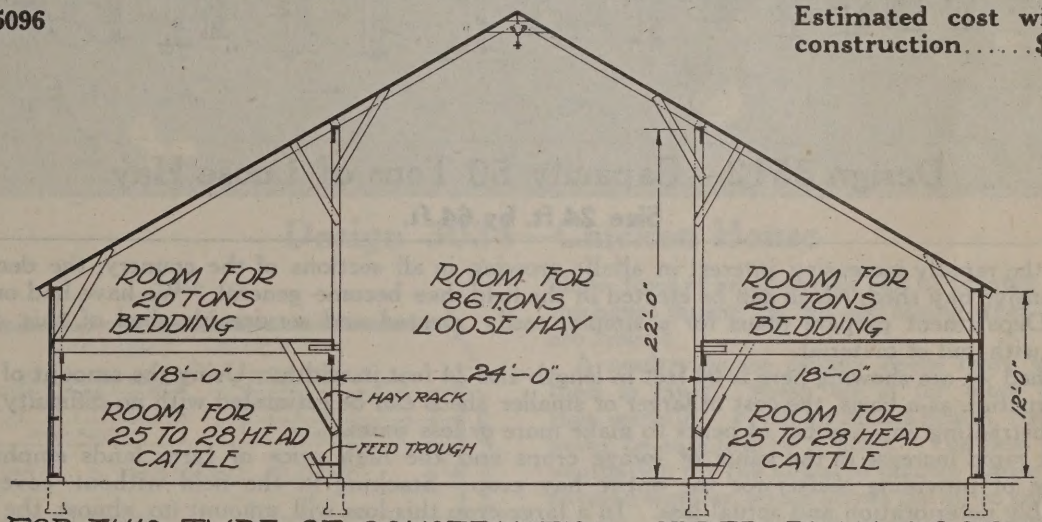
This plan meets the general requirements for feeding cattle and can be economically built out of light timber.

Our working plans explain the construction so thoroughly that any one handy with saw and hammer can build it.

It can be built any length to suit capacity required and can be added to as the herd grows.

Design 5096

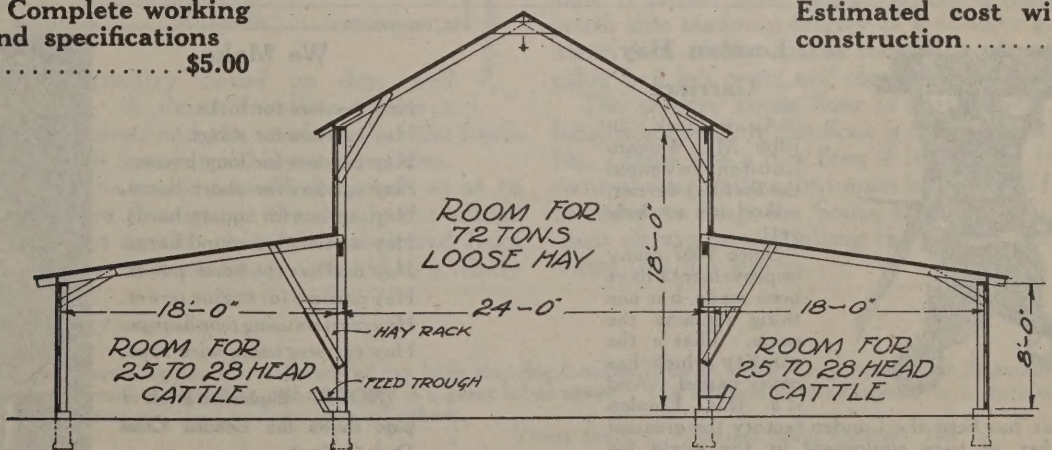
Estimated cost with this construction.....$1,170.00



FOR THIS TYPE OF CONSTRUCTION ORDER PLAN 5096A

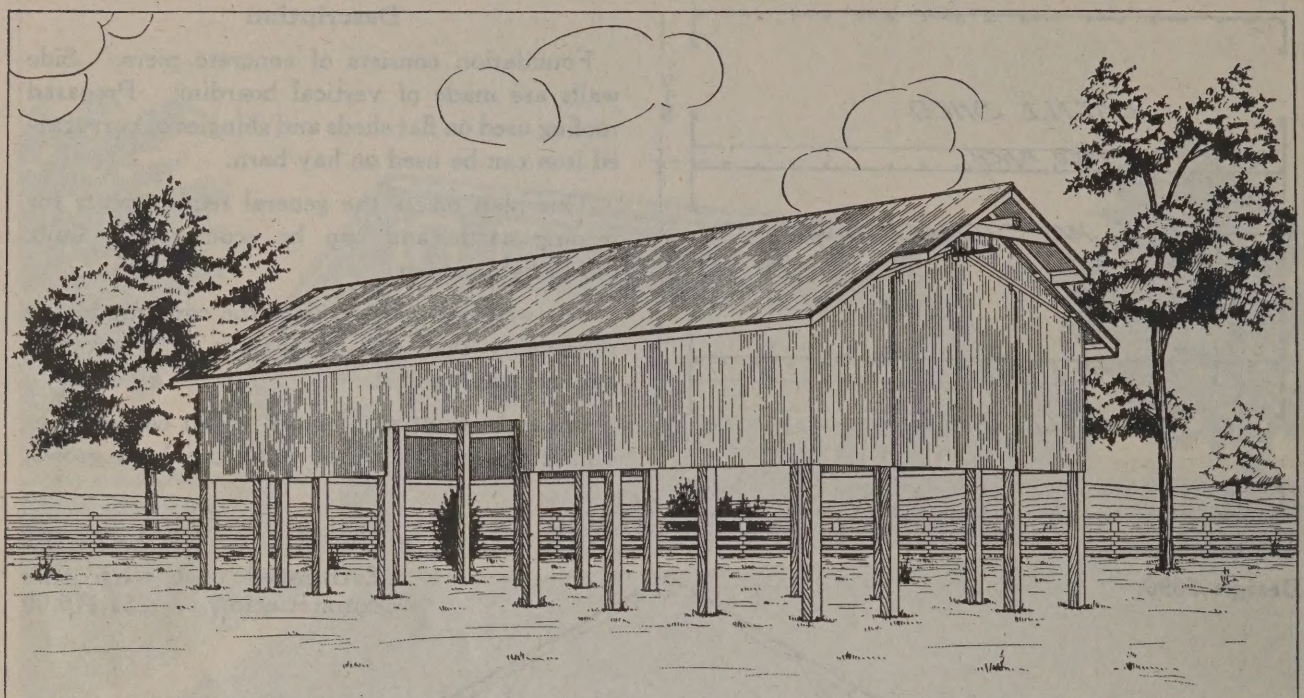
Price of Complete working plans and specifications $5.00

Estimated cost with this construction.....$900.00



FOR THIS TYPE OF CONSTRUCTION ORDER PLAN 5096B

In expensive and Substantial Shelter for Forage Crops



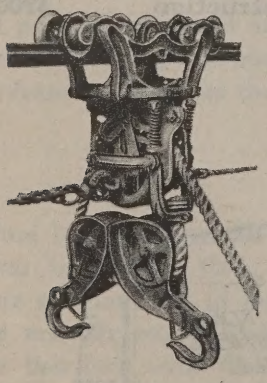
Design 3512—Capacity 50 Tons of Loose Hay

Size 24 ft. by 64 ft.

With the rapidly increasing interest in alfalfa growing in all sections of the country, the demand for an inexpensive hay shed, which can be erected in the field, has become general. We have had our Architectural Department prepare plans for a simple, easily erected and serviceable shed of this character together with bill of material.

The shed we are showing here is 64 feet in length and 24 feet in width. Using the amount of material in this structure as a basis, the cost of larger or smaller sheds can be estimated with no difficulty, by adding or substracting any number of bents to make more or less room.

The rapid increase in the value of forage crops and the high price of farm lands emphasize the advantage of providing shelter for the entire hay crop. Stacking in the field without cover means considerably deterioration and actual loss. In a large crop this loss will amount to almost the cost of a shelter in a year or two. Even in the semi-arid and other regions where the rainfall is inconsequent, the necessity for shedding is felt.



Louden Hay Carriers

Away back in 1866 Mr. William Louden invented the first hay carrier.

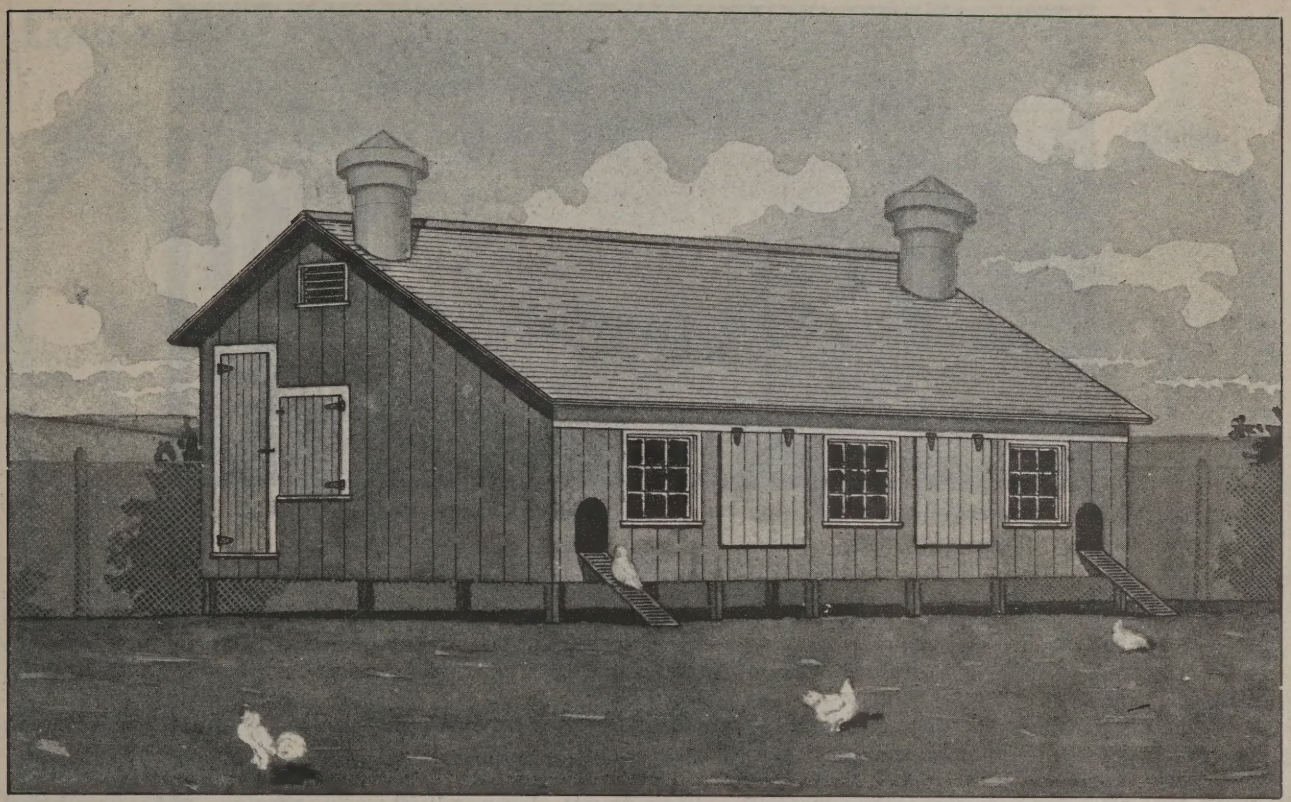
And it's working yet!

Since 1867 many improvements have been made, but one thing remains the same. That's the quality which has never varied. And it's this Louden quality that has kept the Louden factory the greatest manufacturer of barn equipment in the world for almost half a century.

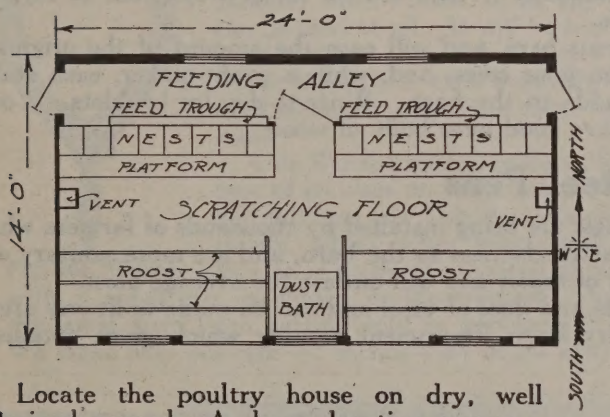
We Make

Hay carriers for forks.
Hay carriers for slings.
Hay carriers for long barns.
Hay carriers for short barns.
Hay carriers for square barns.
Hay carriers for round barns.
Hay carriers for horse power.
Hay carriers for engine power.
Hay carriers using manila rope.
Hay carriers using wire rope.

(NOTE:—Illustration at left of page shows the Louden Cross Draft Carrier.)



Design 3034—Chicken House



Locate the poultry house on dry, well drained ground. A damp location means a damp poultry house, and the result is that the fowls are affected with many troublesome diseases.

Always face the house toward the south so as to get the sun's rays throughout the day in the winter to keep it bright inside. Let it be sheltered from the wind. Where it is necessary to build in a windy place, trees or small shrubs can be planted to shelter the house during the fall and spring when the winds are violent

A poultry house usually needs more ventilation than is given. Fresh air is far more important than warmth. Fresh air means health, but it should never be supplied by a draft. The best system of ventilation for the ordinary poultry house is a cloth covered window, which allows the air to pass through slowly. Only in coldest weather, however, is the cloth pulled across the window. For the rest of the time it is left wide open. Where a house has its south side made up largely of a window group only about half of the spaces should be glazed and the other half left open, and cloth screens supplied.

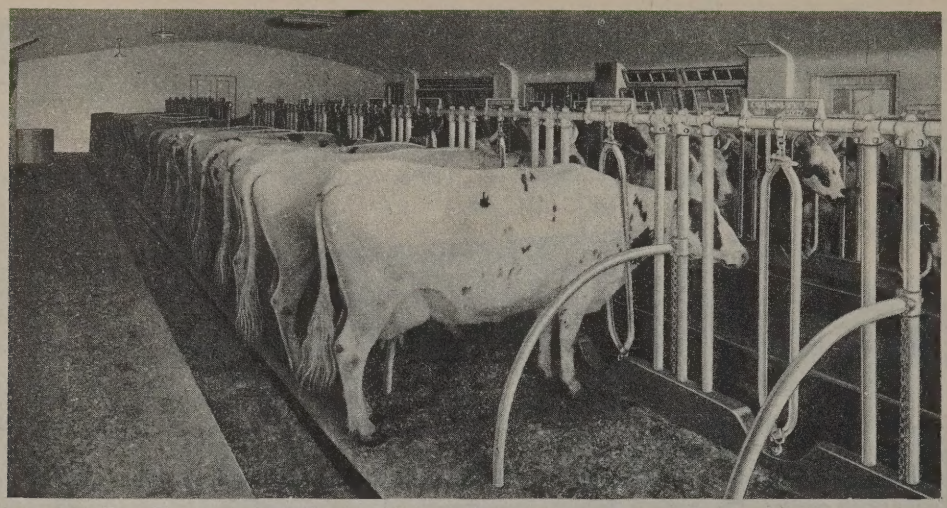
The poultry house floor is important. In many localities a sand or dirt floor is cheaper and is advisable. Hens like a dirt floor if it is dry. It makes a natural dust wallow, but must be replaced frequently in order to keep the house sanitary. A dirt floor must always be well above the outside grass so that water will not run in.

Louden Machinery Company,

Gentlemen:

I am sending you interior view of my barn showing Louden Litter Carrier, Cow Stalls and Stanchions. This outfit has given good satisfaction and certainly is a great labor saver. The automatic track opener is a decided success. I recommend the Louden above all others.

Yours truly, Charles Sorg, Oswego, Ill.



Louden Equipped Milking Barn at Strathglass Farm, Rochester, N. Y.

Louden Steel Stalls

The above photo shows one of the many famous dairy barns that are equipped with Louden stalls. Scientific dairymen long ago began to realize the direct profit in housing their cows in comfort and we often hear of milk production increasing 25 per cent when cows are transferred to Louden equipped barns.

To be contented a cow must be clean and comfortable; she must be surrounded by sanitary conditions; she must have plenty of light and fresh air.

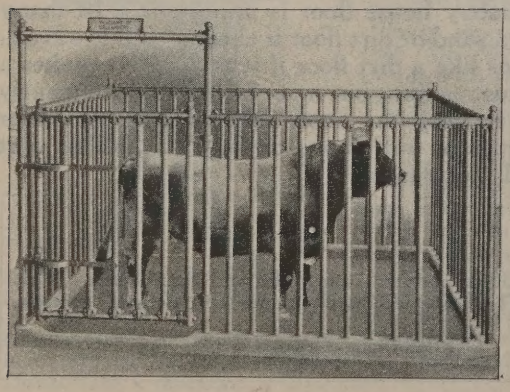
Louden Sanitary Steel Stalls meet every condition. They are constructed of high carbon tubular steel—the strongest material to be obtained. They do not obstruct light or ventilation. They are fitted throughout with overlapping, dust-proof malleable iron connections. They are absolutely sanitary; there are no cracks or crevices to collect filth and breed bacteria. There are no sharp projections to injure the cow; every corner is rounded and perfectly smooth.

Louden Sanitary Steel Stalls will last as long as your barn, and will earn the amount of the original cost over and over again in the increased profits from your cows; and, while a profit-maker, each stall is a pleasure to the owner in the attractiveness it adds to the barn. Write to-day for booklets. You can buy Louden Steel Stalls cheaper than you can have good ones built of wood.

Louden Steel Pens

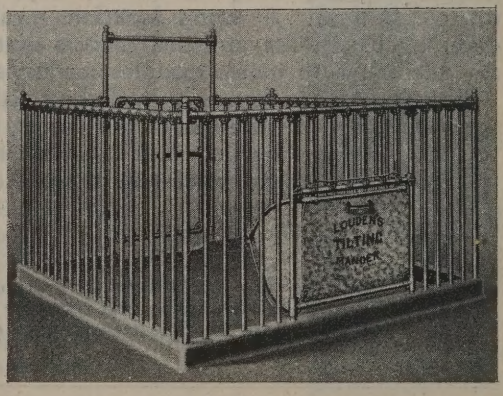
Louden Steel Pens for Cows, Calves, Bulls and Hogs, are being installed by thousands of farmers who find that steel pens cost little more than wood, add attractiveness to the barn, and are more sanitary as they are easy to keep clean. Steel pens never get out of repair and will outlast the average barn.

Louden Steel Pens are furnished in various weights and sizes of steel and can be made to fit any area that it is necessary to enclose. Write for our Dairy Barn Equipment catalog which gives detailed description and prices.



Louden Steel Pens are Sanitary and Strong

Write for Special Catalogs



Louden Tubular Steel and Wood Lined Cow Stanchions

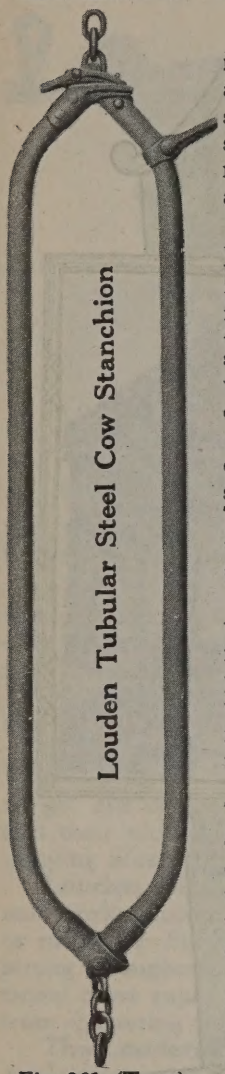


Fig. 861. (Togo).

The tie or the means to hold the cow in the stall, is of the utmost importance. It comes in the most direct contact with the cow, and it must be right to secure the best results. It must hold her securely so she cannot get out of her place, and at the same time she should not feel in the least degree hampered in her natural movements. In other words, the cow must be securely held in the stall and at the same time she should not feel that she is being held at all.

Many devices have been made to secure this result, but after the most thorough tests it is the general consensus of opinion by the best posted dairymen in the world that there is nothing that equals Louden Tubular Steel Stanchion, which is shown by Figure 861, and Louden Wood-Lined Stanchion shown in Figure 937. They are strong enough to hold the heaviest bull when he tries to get out, but when in his proper place there is not a feather's weight of pressure on him.

The slack in the chains which hold them will permit the lower end of the stanchions to swing nearly a foot forward and back or sidewise, while the upper end is susceptible of an almost equal play. The cow can freely move her head from side to side, can reach back to her flanks and get up and lie down and can rest in a natural position just as easily and unrestrainedly as she would out in the field.

There isn't a rough spot or corner about the stanchions that would injure the neck of the most delicate calf. Every part is perfectly smooth, and is so shaped that it will give the cow the greatest possible freedom while securely holding her in place The chains will permit the stanchions to freely turn to give the cow all necessary freedom, and yet, not turn so far as to "get wrong side to", as it would if it had a swivel.

The Louden Stanchions can be hung in Wood Stall Frame or in Tubular Steel Frame, or in any other place where a cow stanchion can be used at all. As will be seen by Figure 861, the Steel stanchions consist of two sides, which are 1 $\frac{5}{16}$ inch O. D. Tubular Steel, and which have their ends inwardly bent toward each other, and fitted with latch irons at their upper ends, and hinge irons at their lower ends.

Our Wood-Lined Stanchion shown by Fig. 937 is decidedly the best of its class on the market. It has substantially the same hinge and latch as our Tubular Steel Stanchion, and a number of its good points, which other wood-lined stanchions do not have. Besides this, it is made of a special shape of high carbon T steel, provided with a small rib as shown in illustration. This rib adds considerably to its strength and prevents the wood strip from getting split or knocked off, which is liable to occur in other wood-lined stanchions. We make only one size—7 inches wide in the clear by 4 feet long.

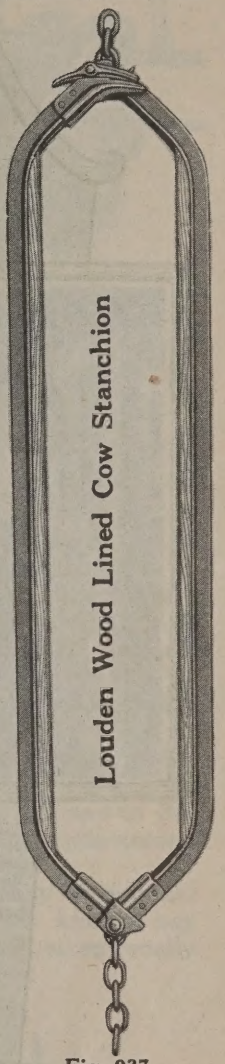
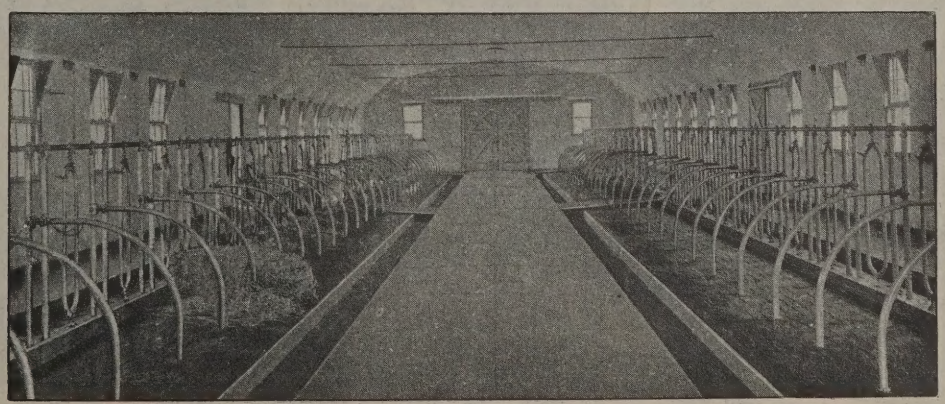
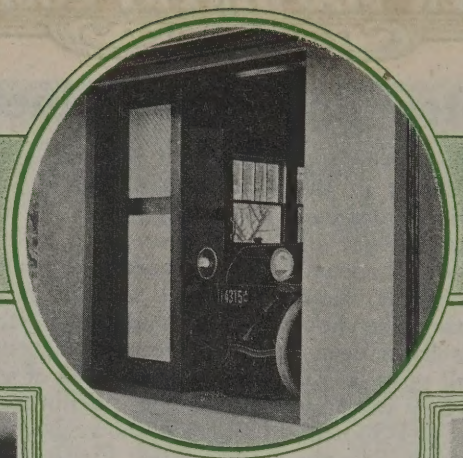


Fig. 937.





Car can stand within a few inches of the door. No waste space with the Louden-hung door.

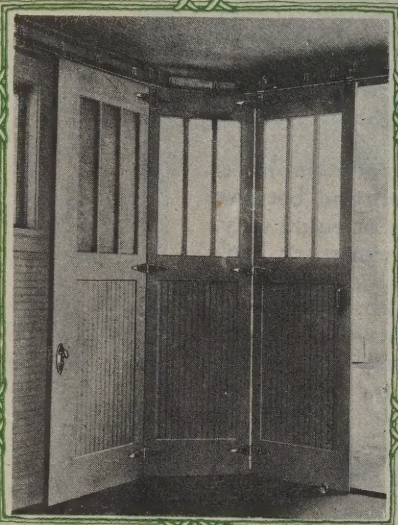
THE LOUDEN GARAGE DOOR HANGER.

Meets every condition perfectly—convenience, safety, space economy, ease of operation, permanence, inexpensiveness, and beauty of design.

The door is built in three parts, hinged together, so it can slide around a short curve. It is hung on swiveled roller-bearing trolleys that operate on a continuous steel track.

The track extends across the door opening, inside, and for an equal distance along the adjoining wall, curved at the corner.

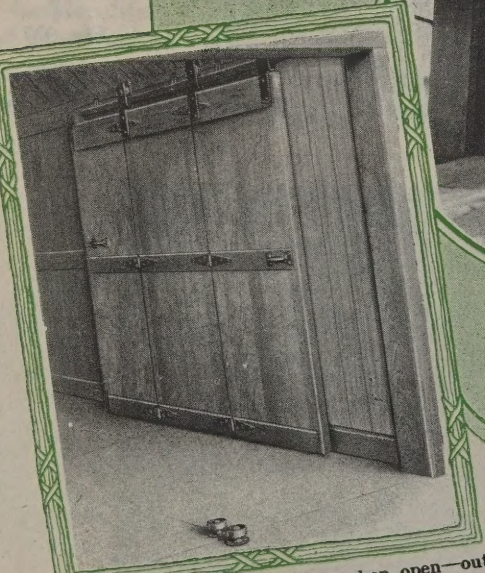
Because of the room it saves, the convenience it affords, and the lasting satisfaction you will derive from it, the Louden-hung Garage Door is an exceptionally profitable investment.



The door slides around the corner smoothly. Ease of operation makes it popular.

Exterior view of Double Garage in which two Louden Doors are used.

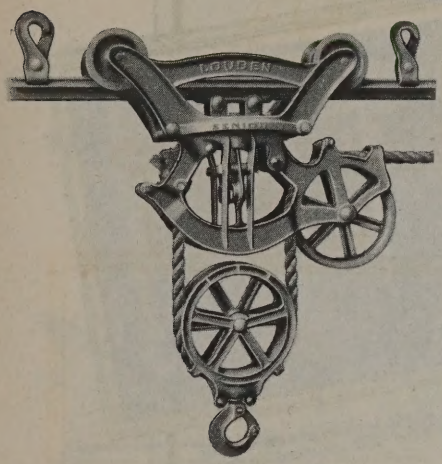
When closed, door fits snug and tight. Everything inside out of the weather and free from obstructions.



Door lies flat against the wall when open—out of the way.

One section swings like an ordinary hinged door, making it unnecessary to build a special door for walking in and out.

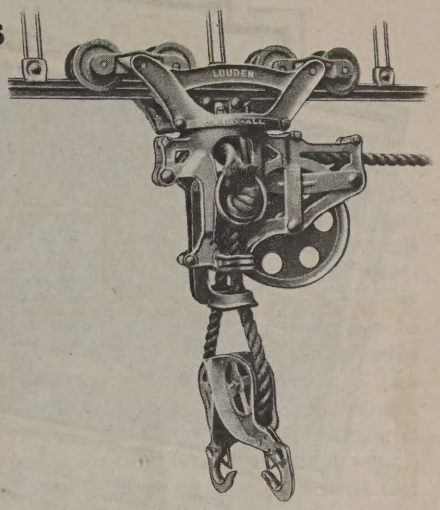
Louden Hay Tools



Louden Senior Fork Carrier.

Hay harvest is short and the crop is valuable. A delay of a few hours when the hay is down may mean a serious loss. Insure your hay crop by installing hay tools in which you can place confidence under all conditions; which will enable you to take care of your crop quickly and easily.

For quick, dependable, thoroughly satisfactory service in hay time, at the barn or in the field, Louden Hay Tools are unequalled. They have been for many years the world's standard. They are compact, durable, simple in construction and positive in their action. Louden quality is known in every part of the globe where hay is harvested by modern methods.



Carry-All Sling Carrier

The Louden Fork and Sling Carriers, the Balance Grapple Fork, and the Carryall Sling are unusually dependable and satisfactory hay unloading tools. They are the result of years of study and experiment. They represent the best in material and workmanship; the strongest, most practical, most efficient tools of their kind sold, regardless of make or price.

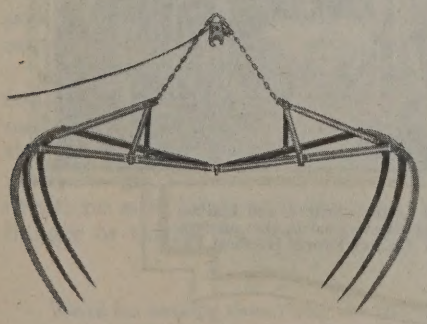
We also manufacture Pulleys, Field Stackers, Power Hoists, etc. The complete line is shown in the Hay Tool catalog. Copy mailed on request.

Louden Fork and Sling Carriers are made for steel, wood or cable track in twenty different styles. There's a carrier to meet every condition which may arise. The parts are few and simple; there is nothing to get out of order. Efficiency is the watchword in the manufacture of Louden Carriers, and to this fact their wide popularity is largely due. The Louden Senior fork and sling carriers, shown in the accompanying illustrations, are two of the leading carriers for American use.

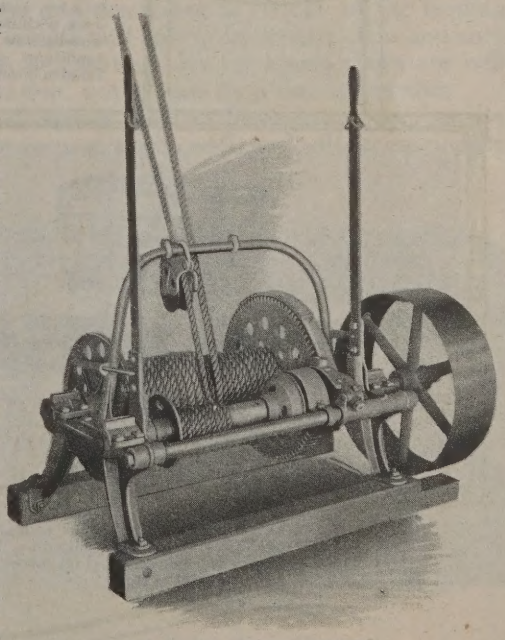
Louden Slings were the first to be put on the market, and continue to be first in quality of material and workmanship. They are made in several styles and may be successfully used for any kind of hay or roughage. For heavy work the Carryall sling is the leader. It has a double lock and is built exceptionally strong throughout. It has four parallel ropes with two additional cross ropes between the spreaders to keep short stuff from shattering through. It is factory tested at 3000 pounds.

The Louden Power Hoist is made in two styles, single and triple drum, and may be used for mowing hay in either a center-drive or an end-drive barn. It may be operated with steam, gasolene or electric power. The power hoist will give you a valuable "lift" in hay time. It saves the labor of one man and one team, and does the work in one-half or one-third the time.

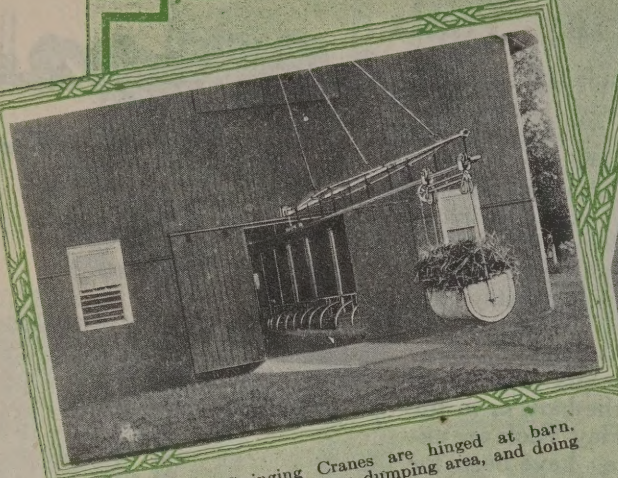
The Louden Power Hoist will not only prove a time and dollar saver during hay time, but will prove a handy help about the farm whenever a "lift" is needed. It is used successfully for elevating wagon boxes, removing hay racks, and in building construction. It is the most reliable hoist ever offered at anywhere near the price, and we can recommend it from every standpoint. Nothing ever offered equals the Louden Power Hoist and Carryall sling for putting hay into the mow or on the stack.



Louden Balance Grapple Fork.



Louden Single Drum Power Hoist.

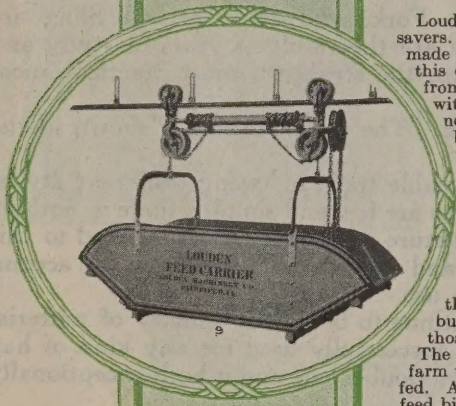


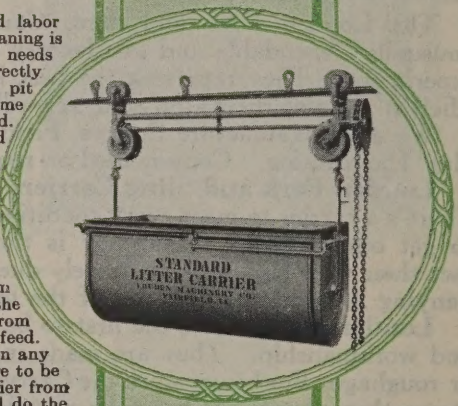
Louden Swinging Cranes are hinged at barn, making possible a large dumping area, and doing away with posts in the yard.

Track arranged with slight incline so carrier may be emptied with trip rope and returned to barn. A barn in Sweden.

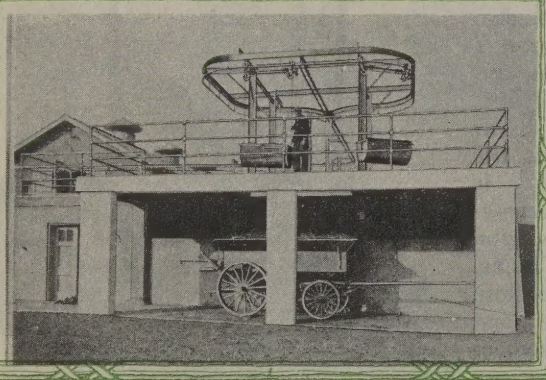
Louden Carriers

Louden Litter Carriers are great time and labor savers. With a Louden Litter Carrier barn cleaning is made easy and pleasant work. Every farm needs this equipment. Manure may be taken directly from the stalls to the spreader or manure pit with but one handling and in half the time necessary by the old-fashioned method. Loaded cars may be raised and lowered to any height by a small boy, and run out and emptied anywhere desired. Write today for detailed information and catalogs and lessen your winter barn work. Louden Carriers are made in several different styles both for Steel and Wire Track.

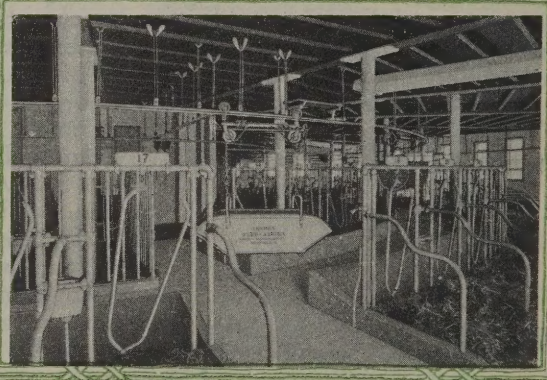




Louden Feed Carriers are relief from the bucket, the wheelbarrow and the bushel basket, and the waste resulting from those old-fashioned methods of handling feed. The Louden Feed Carriers are a necessity on any farm where a dozen or more head of stock are to be fed. A boy of ten years can operate the carrier from feed bin or silo to mangers or feed racks, and do the work with less effort than it takes you to run a loaded wheelbarrow. Write us, giving outline of your feeding conditions, and we will gladly furnish estimates free. Louden Feed Carriers are made in many styles.



An intricate but successful track arrangement at the Soldiers' Home, Washington, D. C. Louden track can be furnished on special order for any degree curve.



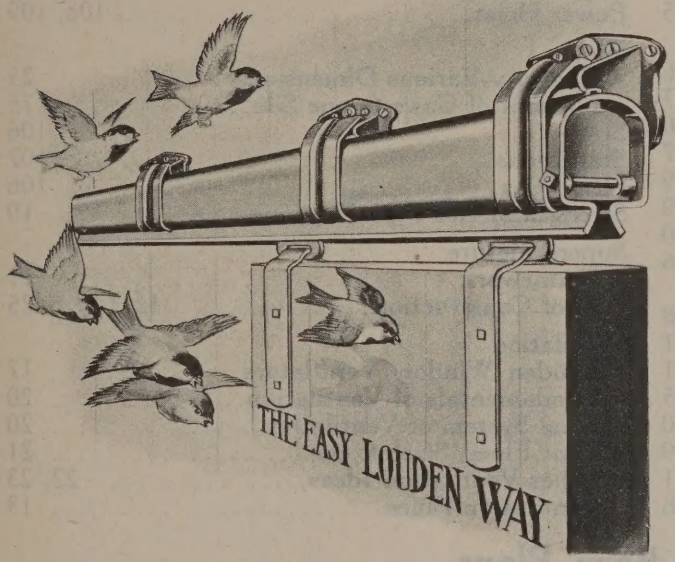
Louden Feed and Litter Carriers, and Louden Stalls and Stanchions are used in this modern round barn at the Hershey Farms, Hershey, Pa.

Louden Barn Door Hangers

Louden Barn Door Hangers are unexcelled for use with any door where it is desired to overcome the inconvenience and awkwardness of a clumsy swinging door.

Special Features of Bird Proof Hanger

TROLLEYS COMPLETELY ENCLOSED. The only opening is the narrow slit beneath the track. There is no chance for the trolleys to be clogged or derailed. The track is absolutely proof against nesting birds, trash, rain, snow or sleet.



FLEXIBLE AT TWO POINTS. The joint in the hanger strap allows the door to swing out away from the building, frequently avoiding breakage by crowding stock. The joint in the track support permits the track itself to swing out from the building, making it possible to easily dislodge trash and dirt which may accumulate behind the track and rot out the siding. This double flexibility allows the door to fit snugly without sticking or binding.

ROLLER BEARING TANDEM TROLLEYS. The trolley wheels revolve on hardened steel roller bearings around a tempered steel shaft. Always roll easily. A light push will open or close the heaviest door.

TROLLEYS RUN ON LEVEL TREAD. The Bird Proof track is square, not oval. The level tread reduces friction to the minimum and overcomes the wedging tendency frequently found in oval tracks which support heavy doors.

SIMPLE AND STRONG IN CONSTRUCTION. The form of the Bird Proof track, and the special grade of steel used in its manufacture, combine to give it wonderful strength and rigidity. It is further strengthened by the curved lips on the under side of the track. Will not sag under the weight of heavy doors.

Louden Double Tread Barn Door Hanger

The Double-Tread was the pioneer flexible barn door hanger, and continues to be one of the leading hangers in the market. It is compact, durable and serviceable, simple and strong in construction and sure in its operation. Thousands of these hangers which have been in constant use for many years are still rendering faithful, efficient service—never a hitch in their operation, not a cent paid out for repairs.

The Double-Tread is in reality two sets of hangers—a set on each side of the door fitted to run on opposite edges of an inverted T-rail. The track is flexibly hung to brackets secured to the wall, and will accommodate itself to the inequalities of the barn siding. The door can be closely fitted without danger of sticking or binding on account of the warping of door or siding. This feature gives it a decided advantage over all rigid hangers. The track, being a T-rail, takes up the least possible room, and the hanger frame is consequently shortened and straightened.

The parts of the hanger being clamped solidly together on both sides of the track make it impossible for the trolleys to jump the track. The door is always in place and ready to go. There is an absolute center draft; no side hitch to make a strain on the hanger or throw the door out of plumb.

Louden Double Tread Barn Door Hanger.

Write for catalog describing the full line of
LOUDEN BARN DOOR HANGER

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LOUDEN MACHINERY CO.
FAIRFIELD IA.